

DECIDING VOICES

ENGINEERS and production executives are active and highly important factors in the electric refrigeration industry today. Due to keen competition and the constant advancement of new ideas—plus an increasing demand for the application of refrigeration to many new uses—productive and creative minds are in control of manufacturing operations.

Theirs are *deciding voices* in the determination of the metals, the finish, the fittings, the insulation, etc., which shall be specified as parts of the finished equipment. Theirs are *deciding voices* in the selection of the machinery, tools and accessories which shall be used to speed up and make more efficient the manufacturing processes.

Installation and service men in their activity, too, face practical problems and reach definite conclusions about the kind and quality of performance necessary in refrigeration parts and materials. How it works "on the job" is the final test on which these men pass judgment.

It is significant that the many engineers, pro-

duction executives, installation and service men who are regular readers of Electric Refrigeration News have asked for an increased amount of news and educational material of special interest to them. (See the comments from subscribers published on page 8.) The Engineering Section is provided to meet this demand.

Manufacturers who have advertised parts, materials, accessories, machinery and tools in Electric Refrigeration News know that it reaches the men who make buying decisions. These manufacturers will recognize in the Engineering Section an increased amount of service to the subscriber and therefore an increased amount of service to them.

If you make any products or material which go into refrigeration equipment or are used in its manufacture, installation or service, put your message in Electric Refrigeration News. Here it will be read by men eager to learn of "better ways," men responsive to the story of improved production or service efficiency and—most important—men with *deciding voices*.

F. W. BRACK, *Advertising Manager*.

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office.

The business newspaper of the refrigeration industry

UNIVERSITY OF CALIFORNIA
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VOL. 5, No. 15, SERIAL No. 117Copyright, 1931, by
Business News Pub. Co.

DETROIT, MICHIGAN, MARCH 25, 1931

Entered as second-class matter
Aug. 1, 1920, at Detroit, Mich.
FIFTEEN CENTS PER COPY
TWO DOLLARS PER YEAROKLAHOMA
AND KANSAS

BAN MERCHANDISING BY PUBLIC UTILITIES

CRACK FRIGIDAIRE
SALESMEN FETED
BY HOME OFFICEPlant Production Schedule
Now Up To 1,800
Units Daily

Dayton.—Frigidaire, General Motors, and the city of Dayton made virtual holidays of March 16 and 17, when more than 100 leading Frigidaire salesmen journeyed to Dayton to help home office men celebrate the tenth anniversary of their organization.

The guests saw the Frigidaire factory go through its paces during their visit. Production schedules are now up to 1,800 units daily. E. R. Godfrey, vice-president in charge of manufacturing, told the group.

While Dayton citizens crowded the streets to observe and applaud, the visiting salesmen—members of the B. T. U. Club, who had made 150 per cent or more of their quota in 1930—paraded through the heart of the city at noon Monday.

Participating in the parade were dealers and salesmen of the several lines of General Motors automobiles, the Dayton Chamber of Commerce, a brass band, and the local police and fire departments.

Flags, banners and "welcome" cards decorated the city. The honored salesmen rode in new models of G. M. automobiles.

Featuring the parade was the Frigidaire float, atop of which rode Doris Herlig, former "Follies" girl, who was

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ICE-O-MATIC PLANS
30-DAY SALES DRIVE

Bloomington, Ill.—The Williams Oil-O-Matic Heating Corp., through its Bloomington sales organization, will launch a 30-day Ice-O-Matic campaign April 1 to sell 250 units in this city.

The same sales methods which, in a previous campaign, established a record of 125 sales in 30 days, will be employed. At present there are in excess of 1,000 Williams units installed in Bloomington.

During the week of March 16 more than 300 Bloomington business men, including three of Bloomington's civic clubs, were entertained with noon luncheons at the factory.

The full length of the dining hall on one side was given over to an advance spring showing of the Ice-O-Matic line.

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N.E.M.A. REFRIGERATION
GROUP TO CONVENE

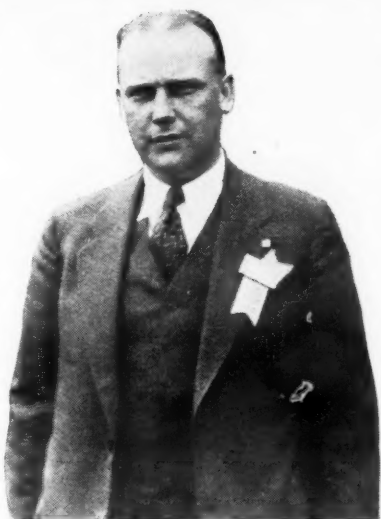
Cleveland.—The refrigeration committee of the National Electric Manufacturers Association will meet here Wednesday, March 25, according to Louis Ruthenburg, chairman of the committee.

The following men are members of the committee: T. K. Quinn and A. R. Stevenson, representing General Electric Co.; E. G. Biechler and Harry Williams, representing Frigidaire Corp.; George Mason, representing Kelvinator Corp.; Colonel Frank E. Smith and E. T. Williams, representing Servel, Inc.; Carl Taylor, representing Westinghouse Electric & Mfg. Co.; G. M. Johnston, representing Universal Cooler Corp.; and Louis Ruthenburg and Glenn Muffy, representing Copeland Sales Co.

N.E.L.A. COMMITTEE TO MEET

Chicago.—The Refrigeration Bureau of the National Electric Light Association will meet here Friday, March 27. The merchandising committee is meeting here in the Edgewater Beach Hotel in a four-day session from Tuesday to Friday, March 27.

First To Qualify

R. A. SOMMERVILLE
Frigidaire Salesman from Albany, N. Y.CANADA NORGE CORP.
FORMED IN TORONTO

Detroit.—Arrangements completed recently by the Norge Corp. of this city with DeForest-Crosley, Ltd., Toronto, Ont., have resulted in the formation of the Norge Corp. of Canada, Ltd., with offices at Toronto.

Norge Corp. of Canada, Ltd., has acquired full Canadian patent, trade mark, manufacturing and sales rights as well as all future developments of the Norge Corp. of Detroit.

The Canadian company has just imported 1,000 complete Norge refrigeration cabinets from Detroit to start operations pending the establishment of complete manufacturing facilities.

Light manufacturing will start, within the month, at a temporary Toronto factory. Plans are being rushed for the speedy erection of a large plant near Toronto in which complete Canadian manufacturing facilities will be established.

The capital stock of Canadian Norge is owned by DeForest-Crosley, Ltd. The appointment of D. H. Pollitt, formerly vice-president and managing director of DeForest-Crosley, Ltd., has been announced as president and general manager of the Norge Corporation of Canada, Ltd.

COPELAND PLANS
NEW STOCK ISSUE

Mt. Clemens, Mich.—Alterations of the capital stock structure of Copeland Products, Inc., will be proposed to stockholders of the company at a special meeting to be held April 7.

The proposed change will provide for a new issue of 100,000 shares of no par value common stock to be exchanged for all issues now outstanding on a basis of three shares of the present "A" stock for one share of the new stock and thirteen shares of the present "B" stock for one share of the new stock.

The Class "A" shares are entitled to preferential non-cumulative dividends in the amount of \$2.50 per share before the "B" shares participate in earnings. Dividends above the \$2.50 per share allotted to "A" shares are to be equally divided between the "A" and "B" issues, share and share alike. The "A" shares, in the event of liquidation, have preferential rights as to assets to the extent of \$35.00 per share. Voting rights reside in the "B" stock.

There are outstanding at the present time 101,991 shares of Class "A" stock and 234,980 shares of Class "B" stock. The exchange of stock will require 52,072.4 shares of the new stock, which will leave 47,927.6 shares unissued.

In his letter to stockholders announcing the special meeting, Louis Ruthenburg, president, stated, "After careful study of the many considerations in-

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KELVINATOR SPRING
SALES POLICIES SET

Detroit.—Kelvinator and Leonard field representatives, including branch managers, district managers, regional directors, field sales representatives, and field service representatives assembled at the Kelvinator plant in Detroit from March 20 through March 23 to discuss spring selling plans.

Sales Manager J. S. Sayre took charge of the Kelvinator meetings, while A. H. Jaeger, vice-president, in charge of sales, led the Leonard group.

The Kelvinator field men were given attention Friday and Saturday, while the Leonard men came Saturday and stayed over Sunday through Monday for their meetings.

Private conferences with department

(Concluded on Page 4, Column 4)

Late News Flashes

OKLAHOMA CITY, OKLA.—(Telegram to Electric Refrigeration News).

GOVERNOR SIGNS BILL PROHIBITING UTILITIES MERCHANDISING
C. M. MCMILLEN

TOPEKA, KANS.—(Telegram to Electric Refrigeration News).

FROM AND AFTER THE FIRST DAY OF AUGUST 1931 IT SHALL BE UNLAWFUL FOR ANY INDIVIDUAL FIRM OR CORPORATION ENGAGED IN THE MANUFACTURING TRANSPORTING DISTRIBUTING OR SELLING OF HEAT GAS WATER ELECTRICITY OR ELECTRICAL CURRENT TO ENGAGE IN THE MANUFACTURE WHOLESALE OR RETAIL BY SALE OR LEASE OF ANY CHATTEL ARTICLE COMMODITY OR MANUFACTURED PRODUCT EXCEPT THOSE ARTICLES WHICH HAVE BEEN OWNED BY SUCH UTILITY COMPANY IN MANUFACTURING DISTRIBUTING OR SELLING ITS UTILITY SERVICE OR THOSE ARTICLES WHICH ARE THE DIRECT PRODUCT OF THE BUSINESS OF MANUFACTURING OR DISTRIBUTING SAID UTILITY SERVICE—E A CORNELL SECY OF STATE

CARSON CITY, NEV.—(Telegram to Electric Refrigeration News).

BILL DEFEATED BY SENATE
MARCH SEVENTEENTH RELATIVE SALE HOUSEHOLD APPLIANCES BY PUBLIC UTILITIES COMPANIES—W G GREATHOUSE SECY OF STATE

SPRINGFIELD, ILL.—(Telegram to Electric Refrigeration News).

BILL PROHIBITING PUBLIC UTILITIES FROM ENGAGING IN RETAILING BUSINESS INTRODUCED
MARCH SEVENTEEN STOP NOW IN COMMITTEE STOP COPY OF BILL MAILED YOU TONIGHT

D W FELTS

ILLINOIS STATE JOURNAL

ILLINOIS, NEVADA,
NEBRASKA STUDY
SAME SITUATIONHardware, Furniture Dealers
Push Anti-Utility
Legislation

Oklahoma City, Okla.—Effective June 17, public utilities in this state will be prohibited by law from merchandising electric refrigerators and other electrical appliances. The bill was signed by Gov. William H. Murray March 19. Central station officials are expected to fight its enforcement.

Provision is made by the new law to permit public utility companies to sell merchandise which they now have in stock and that which may be repossessed for purposes of making collections. Hardware dealers of the state and furniture dealers were active in obtaining passage of the bill.

Charles Nelson, secretary of the State Hardware Men's Association of Oklahoma; Ben Wood, secretary of the State Furniture Association (both of Oklahoma City), and Elmer Harbour, Muskogee furniture man, appeared before the legislative committee to represent the dealers' interests.

Merchants' sale of appliances would drop 50 per cent if corporations were denied the right to offer them for sale. J. F. Owens, general manager of the Oklahoma Gas & Electric Co., told the committee in a hearing before passage of the bill.

KANSAS

Topeka, Kans.—Firms or corporations engaged in the production, transportation, distribution or selling of heat, gas, water or electricity will be prevented from engaging in the merchandising of anything except its own service or articles used in producing that service, according to the provisions of a bill which has been passed by the Kansas legislature and signed by the governor.

The measure will go into effect August 1.

NEBRASKA

Omaha.—A measure now before the state legislature of Nebraska seeks to forbid all public service companies from selling appliances, either electric or gas.

The sponsors of the proposed law claim that such companies can buy appliances cheaper than individually owned stores, because of the quantity purchased. They also state that with the gas and water company owned and operated by the people in Omaha there is no tax to pay and that such privilege should not be allowed.

ILLINOIS

Springfield, Ill.—A bill prohibiting public utilities from engaging in retail merchandising has passed its first reading in the lower house of the legislature and is now in the hands of a committee.

NEVADA

Carson City, Nev.—Public utilities can continue to merchandise household appliances in this state—at least until another session of the state legislature.

A bill which would have prohibited central stations from selling electric refrigerators and other current-consuming specialties in towns of more than 1,000 population was killed in the state senate March 17. Previously the bill had

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Frigidaire On Parade



Mammoth float which caught eyes of Dayton populace in B. T. U. club parade.

WESTINGHOUSE SALES DEPARTMENT SPLIT

Mansfield, Ohio—Two divisions now comprise the merchandising department of the Westinghouse Electric & Mfg. Co., according to C. E. Allen, vice president of the company.

Both divisions of the merchandising department will make their headquarters here.

M. C. Morrow, sales manager, will have charge of one division and F. R. Kohnstamm, director of merchandise, will supervise the other division.

Under the new plan, Mr. Morrow will have charge of the entire sales organization and sales policies of the company.

Mr. Kohnstamm will be responsible for the development of the product, the service and the preparation of advertising materials.

In the division under Mr. Morrow the following appointments have been made: C. D. Taylor, refrigeration; C. H. Collins, radio; R. L. Du Val, large appliances; R. E. Imhoff, small appliances; R. B. Austrian, retail distribution; R. C. Cosgrove, rural distribution, and Marshall Adams, sales promotion manager.

District merchandising managers will be as follows: northeastern, G. T. Dunklin; middle Atlantic, W. Bandorf; southeastern, W. L. Southwell; central, P. Y. Danley; northwestern, J. J. Stanton; southwestern, C. A. Meier, and Pacific Coast, George Bailey.

In Mr. Kohnstamm's division the following assistant directors of merchandise have been appointed: Reese Mills, ranges, appliances, water heaters and farm lighting; J. F. O'Donnell, refrigerators, fans and vacuum cleaners.

L. W. Staunton has been appointed advertising manager of the division under Mr. Kohnstamm.

M. C. Rypinski, former radio department manager, has been made an assistant to the commercial vice-president.

Seventeen Candles Adorn Large Kelvinator Birthday Cake



George W. Mason accepting birthday cake adorned with seventeen candles and a miniature Kelvinator, which was presented to the company on March 11 by officials of the Hotel Statler in Detroit.

Huge Birthday Cake Given to Kelvinator

Detroit—On the anniversary of its seventeenth birthday, a huge cake, with a miniature Kelvinator mounted atop, and decorated with 17 candles, was presented to the Kelvinator Corp. by the Hotel Statler management on March 11.

The cake was presented to George W. Mason, president of Kelvinator, by J. Henry Pichler, resident manager of the Statler, assisted by Joseph M. Busha, assistant manager.

Following the presentation the cake was exhibited at the Kelvinator plant for a day and then transferred to the display windows of the Detroit Kelvinator branch, where it was exhibited under spotlights.

The Kelvinator birthday cake was a Vienna sponge mixture, sufficient for 300 people. It was two feet in diameter, and more than two feet high to top of the Kelvinator. It was made according to the following recipe: 14 lbs. sugar, 210 yolks, 210 whole eggs, 12 lbs. flour, 2 lbs. cornstarch, 5 lbs. melted butter, 1 doz. grated lemon rind. Eggs and sugar were beaten up warm. Flour added to the mixture, and lastly butter. Cake was filled with butter cream and apricot jam.

NORGE CONCLUDES SERIES OF DISTRIBUTOR MEETINGS

Detroit—The Norge Corporation, a subsidiary of Borg-Warner Corporation, has concluded a series of 1931 trade district sales conventions held this month by a number of its distributors.

Conventions were held at Charlotte, N. C., and Springfield, Mass., March 17; Richmond, Va., and Boston, March 18; Baltimore and Philadelphia, March 19; New York City, March 20; Pittsburgh, March 23; Cleveland, March 24; Chicago, March 25.

Other conventions were held earlier in the month at Cincinnati, Charleston, W. Va., Buffalo, St. Louis, Indianapolis, Des Moines, Minneapolis, Nashville, Memphis, Milwaukee, Birmingham, New Orleans, Columbus, Jacksonville, Atlanta, Rochester, N. Y., and Syracuse.

Factory representatives who attended these distributor-dealer conferences were: H. E. Blood, president and general manager; J. H. Knapp, vice-president and director of sales; G. O. O'Hara, sales manager; R. E. Densmore, T. P. Hallock, J. E. Oliphant, and R. E. Wallace, district managers.

Representatives of the Cramer-Krasse Co., Milwaukee, advertising and merchandising counsel, who represented the agency at these meetings were: H. W. Terry, account executive, and Ralph E. Caldwell, director of merchandising.

In addition, representatives of the Walter E. Heller Co., Chicago, were in attendance to explain Norge time-payment facilities.

DISTRIBUTOR FOR TOLEDO ANNOUNCED BY MAJESTIC

Toledo, Ohio—Stanley Roberts, president of the Roberts-Toledo Co., has been appointed general distributor of the Majestic refrigerator in the Toledo area.

He has purchased the lease and complete stock of the Majestic Distributing Corp., of 703 Adams St.

The deal was completed in Chicago March 2, in the offices of the Grigsby-Grunow Co. The factory was represented in the transaction by B. J. Grigsby, president; Don Compton, vice-president, and V. C. Collamore, sales manager.

Mr. Roberts is one of the eight large distributors in various parts of the country who have returned to Majestic distributors' fold. He had formerly been a distributor of the Majestic products.

The business will continue at the same store occupied by the Majestic Distributing Corp. Besides refrigerators, a complete stock of radios will be carried.

BUNDY JOINS COMPANY IN NEW BRITAIN

New Britain, Conn.—James Truscio, proprietor of the New Britain Store Fixture Co., 353 South Main St., has opened a Copeland showroom at 77 Arch St.

J. O. Bundy, formerly connected with the Oscar B. Bertillon Co., Bridgeport, has been named manager of the new store.

The store fixture company has been handling Copeland refrigerators and Hill Dri-Kold display cases.

BRUNDAGE, MILLER MOVED UP BY LAIDLEY

Spokane, Wash.—S. S. Brundage has been appointed manager of the local branch of the Laidley Co., distributor for General Electric refrigerators.

He takes the place of O. D. Miller, who has been promoted to retail sales manager in Portland.

FRIGIDAIRE CHANGES LOS ANGELES SET-UP

Los Angeles—Frigidaire's new plan of turning all retail branch operations over to dealers, and distributing its products direct to dealer stores, is in effect here. The Southern California district, with headquarters in Los Angeles, is rapidly establishing retail outlets and is centralizing its activities for the most part in one building.

Moving from its former headquarters at 1518 West Seventh St., now taken over by dealer representations, the local Frigidaire organization has taken large quarters on the third floor of the Star Truck and Warehouse Bldg., 1855 Industrial St. Distribution, sales, service, engineering, educational and other divisions will make their headquarters at the new office.

The only division still located at the company's old warehouse quarters on East Ninth St. is the service department and the stockroom. Plans are being made to house this department in the Star Truck Bldg. when additional space is available.

Among the personnel transfers is that of B. J. Dallne, from Los Angeles to San Francisco, where he is serving as district manager.

T. J. McIntyre, formerly sales manager for Frigidaire in Los Angeles, is now district sales manager in charge of operations for southern California.

Recent dealer appointments are: Dreiss Radio, 6730 Pacific Ave.; Home Utilities, Ltd., 6737 Hollywood Blvd., Hollywood; Manual Arts Sales, 4315 S. Vermont Ave.; Santa Monica Radio Co., Ltd., 3055 Santa Monica Blvd.; the Wilshire Refrigerating Co., which opens a new store on Wilshire Blvd., near Western Ave.; and C. M. Sayres, 373 E. Colorado Blvd., Pasadena.

Hazelrigg, Foy & Candee, who have taken part of the old Frigidaire quarters on West Seventh St., will handle commercial and apartment house installations, while Day & McClellan, Ltd., also new dealer appointees, will handle domestic sales at the same address.

BIG N.E.L.A. REFRIGERATION DRIVE STARTS IN CAMDEN

Camden, N. J.—As a forerunner to the co-operative refrigeration campaign sponsored by the Electric Refrigeration Bureau, National Electric Light Association, the Electrical League of South New Jersey in conjunction with the Courier Post newspapers in this city is holding a refrigeration show here.

Ten makes of refrigerators are on display at the show which opened March 23 at the exhibit floor of the Public Service Co. Bldg. Four home economists speak daily at lectures held in the auditorium.

The show closes on March 26 at which time the opening advertisement in the national campaign will appear in the Saturday Evening Post.

To assist in the promotion of the national campaign, the local League has organized a refrigeration division. According to B. A. De Young of the League, many refrigeration dealers in this district are joining the new division.

It is estimated that there are about 150 dealers in this field. A close tie-up with the national co-operative movement is planned and quotas for the year have been increased by the dealers. Recent checkup shows that there are more than 100,000 domestic meters in this territory.

FOUR DES MOINES FIRMS SIGN FRANCHISES

Des Moines, Iowa—Yunker Brothers, Inc., large department store, L. Ginsberg & Sons, and the Rex Radio Co., 3523 Sixth Ave., have been named retail dealers for Majestic. Previously the Rex company handled only the Majestic radio line.

Davidsons Furniture Co., Seventh and Walnut Sts., is now retail dealer for Servel, distributed in this territory by A. A. Schneiderham Co.

Van Horn-Clark, Frigidaire dealers at 809 W. Locust St., have opened a branch store at 618 Grand Ave.

BRADY JOINS ASSOCIATED GAS & ELECTRIC CO.

Elmira, N. Y.—Ivan F. Brady has taken charge of refrigeration sales in the southern New York group of the Associated Gas & Electric System.

Prior to his present connection, Mr. Brady was with the Westinghouse Electric Supply Co., Kelvinator distributor in the Rochester-Elmira district.

NORTHEASTERN RADIO NOW SELLING SERVELS

Boston—Northeastern Radio, Inc., 269 Columbus Ave., here, is now wholesale distributor of Servel electric refrigerators for eastern Massachusetts and northern New England. Six dealers are operating in the Boston territory under the new distributor.

Dealers Told Us They Wanted Quick Action



There is a full-functioning C. I. T. Office near you ready to give complete service. Our Refrigerator Financing Plans are uniformly available from every one of our local offices throughout the country. Think of what this means in getting quick action!

When you want a rush check-up on a prospective purchaser our credit man on the spot will immediately investigate and report, at no expense to you.

As you make sales you send along the contracts (daily if you wish) and our local office will promptly give you cash.

Collections are tactfully made by a trained force of C.I.T. men who know local conditions in your territory.

There is no longer any need for you to burden yourself with credit, collection or financing details—for these our local office is responsible—your full attention may now be devoted to increasing sales.

The C. I. T. Plans cover domestic, commercial and apartment house installations of all approved makes of mechanical refrigerators. Costs are uniformly low, and the Plans entirely free of objectionable "red-tape". Moreover, they are backed by a twenty-two year old organization with large resources and dependable policies.

C.I.T. CORPORATION

ONE PARK AVENUE, NEW YORK

A Unit of

COMMERCIAL INVESTMENT TRUST CORPORATION
CAPITAL AND SURPLUS OVER \$90,000,000

Subsidiary and Affiliated Operating Companies with Head Offices in New York—Chicago
San Francisco—Toronto—London—Berlin—Brussels—Paris—Copenhagen—Havana
San Juan, P. R.—Mexico City—Buenos Aires—Sao Paulo—Sydney, Australia
Offices in more than 160 cities.

THESE C. I. T. LOCAL OFFICES WILL WELCOME YOUR INQUIRY

Abilene - Akron - Albany - Allentown - Altoona - Amarillo
Asbury Park - Atlanta - Augusta - Baltimore - Beckley - Binghamton
Birmingham - Bloomington - Bluefield - Boise - Boston - Bristol
Bronx - Brooklyn - Buffalo - Butte - Camden - Charleston - Charlotte
Chicago - Cincinnati - Clarksburg - Cleveland - Columbia - Columbus
Dallas - Davenport - Dayton - Denver - Des Moines - Detroit - El Paso
Erie - Fort Wayne - Fort Worth - Fresno - Glens Falls - Grand
Rapids - Green Bay - Greensboro - Greenville - Hagerstown
Harrisburg - Hartford - Hempstead - Hickory - Houston - Huntington
Indianapolis - Jackson - Jacksonville - Jamaica - Jamestown - Jersey
City - Kansas City - Kenosha - Knoxville - Lansing - Lexington - Lincoln

Little Rock - Los Angeles - Louisville - Madison - Manchester
Memphis - Miami - Milwaukee - Minneapolis - Minot - Montgomery
Montpelier - Mt. Vernon - Nashville - Newark - New Haven
New Orleans - New York - Norfolk - Oklahoma City - Omaha
Orlando - Philadelphia - Phoenix - Pittsburgh - Portland, Me.
Portland, Ore. - Poughkeepsie - Providence - Raleigh - Reading
Reno - Richmond - Roanoke - Rochester - Sacramento - St. George
St. Louis - Salt Lake City - San Antonio - San Diego - San Francisco
San Jose - Seattle - Sioux Falls - South Bend - Spokane - Springfield
Spring Valley - Stockton - Syracuse - Tampa - Toledo - Tucson - Tulsa
Utica - Washington - Wheeling - White Plains - Wichita - Wilkes-Barre
Youngstown.

*the talk of your
industry.. and
your prospects*

*this
year*

GUARANTEE

and lower prices



ACTION! That General Electric 3-Year Guarantee is getting *action*. It's bringing in the people and closing sales. Easily it's the big thing of this selling season. And the whole trade knows it. At a single stroke this 3-Year Guarantee adds still more punch to every General Electric selling point.

There is the prestige of the brilliant three-year performance record made possible by 15 years of relentless research. There is the famous current-saving Monitor Top.. hermetically sealed.. self-oiled.. lastingly quiet. There are other features such as the All-Steel cabinet, greatest advance of its kind.

LOWER PRICES, TOO

And now comes this unsurpassed 3-Year Guarantee, together with lower prices. Thus all the most substantial, effective buying reasons have been *combined* by General Electric. General Electric dealers are feeling it—IN THEIR VOLUME. *And growing volume does not pyramid service responsibility for General Electric dealers! It does pyramid profits.*

Be sure to learn about the General Electric Commercial line. See yellow Refrigerated Food Section, Page 5 General Electric Co., Electric Refrigeration Dept., Section DF32, Hanna Bldg., 1400 Euclid Ave., Cleveland, O.

52 MONITOR TOP CONVENTIONS have been helping General Electric sales organizations to make the most of 1931 General Electric advantages... including performance superiorities, advertising, sales promotion material and other selling helps.



GENERAL  ELECTRIC
ALL - STEEL REFRIGERATOR

DOMESTIC, APARTMENT HOUSE AND COMMERCIAL REFRIGERATORS—ELECTRIC WATER COOLERS AND MILK COOLERS
Join us in the General Electric Program, broadcast every Saturday evening, on a nation-wide N. B. C. network.

Leading Frigidaire Salesmen Celebrate Tenth Anniversary



Frigidaire Salesmen Visit Factories, See Show, Gather for Annual Banquet

(Concluded from Page 1, Column 1)
the queen of the anniversary jubilee. Other floats in the parade were prepared by the General Motors Radio Corp., Inland Manufacturing Co., and Delco Products Co.

Reception committees met the salesmen at the railroad station Monday morning and, after allowing cameras to click, escorted the guests to their hotel, where breakfast awaited them.

After breakfast the visiting salesmen were taken to the Dayton Engineers' Club, where they were greeted by H. C. Jamerson, sales manager of production distribution, who also was general chairman of the Trip-to-Dayton Committee.

Mr. Jamerson introduced factory officials and department heads and then presented J. A. Harlan, vice-president in charge of sales, who made the keynote speech. The meeting then adjourned for the parade.

Following the parade, the salesmen were taken through the Moraine plant of Frigidaire, just outside of Dayton.

Starting at the wood and cork mill, they were escorted by guides through the mile long plant, visiting the ice cream cabinet, punch press, porcelain, household assembly and final test departments in turn, and then observing the shipping of the completed products from the warehouse.

The annual banquet was held on the night of the first day. The big ballroom in the Miami Hotel practically was torn down and rebuilt for the occasion.

A stage was constructed at one end, spot lights and a motion picture projector were installed at the other. A speakers' table was erected on a platform, which extended across the entire length of the hall.

A Broadway show, featuring Doris Herlig, queen of the jubilee, was presented under direction of William G. Boyle, musical director of the Copley Plaza Hotel, Boston, who for years has arranged Frigidaire entertainment events.

Following the show, the factory surprised the visitors by showing the motion pictures that were made throughout the day.

H. C. Jamerson, Toastmaster

H. C. Jamerson, acting as toastmaster, introduced the following speakers: G. W. Dyer, head of the economics department, Vanderbilt University, Nashville, Tenn.; F. M. Cockrell, publisher *ELECTRIC REFRIGERATION NEWS*, Detroit; William Pickrel, lieutenant governor of the state of Ohio; R. D. Funkhouser, Frigidaire vice-president; J. A. Harlan, vice-president in charge of sales, and E. N. Madden, assistant foreign manager.

"The industrial revolution effected by the introduction of steam power 150 years ago caused business life to become centralized in the cities; but the new electrical-gasoline industrial revolution is rapidly decentralizing our industrial civilization," Prof. Dyer told the banquet audience.

"Prior to the industrial revolution of the 18th century," he continued, "agriculture had reached its peak, and small factories were located in rural communities. There were no large industrial plants. Factories could not ship their products with any degree of speed.

"With the development of the steam engine, factories moved to cities, where man power was to be obtained in abundance. Goods could now be shipped to all parts of the world comparatively quickly. Wealth and brains became concentrated in cities.

"Millions of persons in rural districts

became hopelessly isolated from the rest of the world. Farms became depopulated, and farmers lost special privileges they had so long enjoyed.

"Fifteen years ago," the economist pointed out, "the power of electricity began to be applied; likewise, gasoline. This is the electrical-gasoline age, and these two motive forces are instituting a new industrial revolution.

"Farmers now enjoy all the facilities of transportation open to a city dweller. The radio is opening up vast new worlds for them. Electrical and gasoline devices are lightening their toil. Industries are seeking their lands for factory sites. And cities are fighting to keep the situation within their grasp. This fight of the cities against the forces of decentralization was one of the major causes of the recent depression."

"Pioneering a Necessity"

Lieut. Gov. Pickrel observed that the Frigidaire salesmen were pioneering a necessity. The pioneering spirit, he averred, was truly American.

B. G. Mattern, assistant manager of the foreign sales department, asserted that 70 per cent of all electric refrigerators exported from the United States were Frigidaires, and that one out of every five Frigidaire manufactured is shipped abroad.

F. M. Cockrell, publisher of *ELECTRIC REFRIGERATION NEWS*, pointed out the difficulty of classifying successful specialty salesmen, who apparently are of all types.

Electric refrigeration salesmen, he declared, were lucky to be in the industry during 1930, a year in which all sales records were broken in spite of a valley in the economic curve.

On the morning of the second day the salesmen were taken on a tour of Plant No. 1, located in Dayton, and reviewed the manufacture of coils and compressors. They found both plants in full operation, with operating schedules considerably heavier than those of February, and necessitated by an increasing demand for the advanced refrigeration products which were recently presented.

The guests were given a glimpse into the future of electric refrigeration at an afternoon session March 17, when E. B. Newill, vice-president in charge of engineering, and H. M. Williams, manager of research engineering, presented some of the ideas developed in Frigidaire research laboratories. They were assisted by Dr. Robert Kehoe of the University of Cincinnati.

C. A. Copp, assistant sales manager of the Frigidaire Sales Corp., and B. B. Geyer, president of the Geyer Advertising Agency, were also on the afternoon program.

Vice-President Harlan delivered the closing address, telling the star salesmen that they belonged to that one group of individuals who could lead the economic parade back to prosperity—the nation's salesmen.

Among the Delegates

Members of the selling organization who made the trip to Dayton included the following: A. H. Sanborne and J. A. Woodliff, Atlanta district; F. T. Cleverly, E. F. Davis, E. C. Harrold, L. R. MacIvor, F. L. Oliver, L. A. Sebastian, J. T. Shaughnessy, P. B. Toohy, Boston; Harry Ertz and W. J. Fagan, Buffalo; H. P. Haskins, C. H. Lewis, E. A. Lockwood, S. F. Lupe, G. L. Powell, M. L. Ryan and G. K. Wadsworth, Central Region; Max Schwimmer and H. O. Wilson, Chicago; R. B. Brown, Houston; Guy A. Graves and A. J. Harton,

Kansas City; G. W. Trask, Knoxville; L. M. Anthony, J. S. Baer, T. Campbell, T. Feeney, F. P. Foster, R. L. Foster, E. D. Greiner, A. A. Herman, E. O. Hunt, A. Israel, J. G. Liebert, W. J. McLaughlin, L. McLean, H. E. H. Knight, D. Meister, M. Meyer, P. Mojzls, J. S. O'Connor, C. M. Reed, L. D. Rogers, W. Schmidt, F. G. Schlegel, R. A. Somerville, L. Sullivan, R. E. Smith, L. P. Veloz, R. Van Brammer, W. E. Ward, G. Watson, D. H. Yeoman, R. Michaelis, New York; F. A. Correa, C. E. Kirby, W. O. Tuttle, H. B. Wylie, Miami; J. M. Battles, Milwaukee; R. H. Dillon, A. M. Gathright, W. L. Murphy, J. P. Sensibaugh, and J. E. Walker, Norfolk; T. Knudsen, Oklahoma City; L. I. Dungan, F. C. Fuller, L. E. Kreps, A. Roach, C. W. Weltzin, F. H. Fackler, O. Housen, J. P. Neifing, F. E. Vickrey, R. E. Robertson, R. L. Laws, Oklahoma City; H. M. Camenson, F. A. Gould, Jack C. Glou, H. W. Perbacker, E. W. Russell, Philadelphia; Carl Clifton, C. R. Foy, S. J. Nyswonger, V. V. Vaughn, S. H. Corman, H. N. Henry, C. J. Scott, and L. H. Meyers, Pittsburgh; J. M. Chavez, A. W. Kilgore, R. B. Moran, John H. Hunter, L. G. McGinty, A. W. Whitten, San Antonio; W. H. Becker, C. E. Wildberger, St. Louis; J. T. Underwood and W. W. Green, Salt Lake City; J. D. Cochran, E. C. Freeman and C. E. Miller, Wichita; J. de Boissieu, J. A. Gagner, J. A. Reeves and J. L. Rosseau, Canada, and W. C. Cannon, A. D. Armstrong, and J. H. Pickering, Toronto.

COPELAND MAY CHANGE CORPORATE STRUCTURE

(Concluded from Page 1, Column 3)

involved, and after having had the matter under consideration for some time, the directors and management unanimously came to the definite conclusion that the present capital stock structure is unwieldy, does not properly reflect the real values of the corporation and serves only to impede the future financing that will be necessary for our proper development and growth in this very rapidly accelerating industry. Every effort has been made to develop a revision program that will be entirely equitable to all present stockholders.

"The first quarter of the current fiscal year, ended January 31, 1931, was characterized by increased volume and marked improvement in the company's profit and loss position as compared with the same period a year ago. Orders booked since the annual sales convention held January 14th, have exceeded orders booked in the corresponding period a year ago. Shipments and net sales are larger for January and February, 1931, than for the same months in 1930."

ICE-O-MATIC PREPARING FOR APRIL SALES DRIVE

(Concluded from Page 1, Column 1)

Flood lights were played upon the entire display. The background consisted of contrasting color crepe paper in ray effect which continued up to an overhanging canopy, also of crepe paper.

On Monday, March 16, the Kiwanis Club, with 125 members present, was entertained. R. D. Marshall presided as chairman, and introduced C. U. Williams, president, who welcomed the Kiwanis Club. The president of the Kiwanis Club responded. Ice-O-Matic songs were sung under the leadership of Lyle Straight of the factory organization.

The Young Men's Club was entertained Tuesday, March 17. R. D. Marshall again presided as chairman. W. J. Brevitt, sales manager, and A. A. Shank, of the Ice-O-Matic staff, addressed the meeting.

General Electric Pays \$1.90 a Share in 1930, Second Best in History

Schenectady, N. Y.—General Electric dividends for 1930 were \$1.90 per share on the 28,845,927 shares of no par value common stock, according to Gerard Swope, president.

The total profit available for dividends amounted to \$57,490,915, which exceeds that of every other year except 1929 when \$67,289,880 was declared, or \$2.24 a share.

Orders received during 1930 for all classes of electrical merchandise amounted to \$341,820,312, compared with \$445,802,519 in 1929, a decrease of 23 per cent, and unfilled orders at the end of the year totaled \$56,082,000. This compares with \$94,623,000 at the close of

1929, a decrease of 41 per cent. Sales billed for 1930 were \$376,167,428, as compared with \$415,338,094 in 1929, a decrease of 9½ per cent.

Net income from sales in 1930 amounted to \$40,450,261, which, compared with \$49,395,897 in 1929, shows a decrease of 18 per cent. These figures for 1930 do not include radio set and tube business, which was transferred to the Radio Corporation of America on January 1, 1930, except that derived from G. E. radios, which were introduced in the latter part of the year.

A comparison of income and expenses for 1930 with the previous year appears below:

INCOME ACCOUNT		1930	1929
Net sales billed.....		\$376,167,428	\$415,338,094
Less cost of sales.....		335,717,167	365,942,197
Net income from sales.....		\$ 40,450,261	\$ 49,395,897
Other income.....		13,453,654	9,681,387
Interest and discount.....		3,258,498	3,153,044
U. S. government securities.....		1,757,715	3,929,834
Royalties and sundry.....		1,605,335	4,661,814
		\$ 20,075,202	\$ 21,426,079
Total income.....		\$ 60,525,463	\$ 70,821,976
Less interest.....		\$ 313,078	\$ 450,807
Add. to general reserve.....		2,721,470	3,081,289
		3,034,548	3,532,096
Net profit.....		\$ 57,490,915	\$ 67,289,880
Less 6% on special stock.....		2,574,953	2,574,819
Profit for common stock.....		\$ 54,915,962	\$ 64,715,061
Less dividends common.....		46,150,203	32,449,285
Extra dividends on common.....			7,210,949
Surplus for year.....		\$ 8,765,759	\$ 25,054,827

KELVINATOR FIELD MEN PLAN SALES CAMPAIGN

(Concluded from Page 1, Column 3)

heads occupied most of the sessions.

Leonard men present were: I. E. Cope, Dallas, Texas; J. B. Nicolson, Los Angeles, Calif.; G. S. Sikkenga, Muskegon, Mich.; R. W. McCasky, Chicago; J. B. Whittier, Larchmont, N. Y.; R. W. Tyler, Jacksonville, Fla.; A. B. Curtis, Jr., Dayton, Ohio; H. F. McGrath, Detroit, Mich.

The Kelvinator branch managers present were W. F. Thatcher, New York; G. F. Sutphin, New York; F. J. Foersterling, Philadelphia, Pa.; W. F. Worrell, Cleveland, Ohio; E. Vadakin, Cleveland, Ohio; Harry Troutwine, Boston, Mass.; Frank Blitz, Boston, Mass.; H. B. Barber, Detroit, Mich.; and H. L. Morrison, Detroit, Mich.

Kelvinator district managers, headed by Regional Directors R. I. Petrie and John S. Cortines, came from the following points: G. R. Brogan, Charlottesville, Va.; Herbert W. Browne, Dallas, Tex.; J. C. Burton, Narberth, Pa.; C. V. Calkins, Detroit; S. D. Camper, Louisville, Ky.; J. F. Crossin, Detroit; H. A. Dahl, Minneapolis, Minn.; Wm. E. Day, Seattle, Wash.; Lawrence Klein, Seattle, Wash.; L. L. Langley, Durham, N. H.; J. K. MacCarthy, Raleigh, N. C.; T. H. Maginniss, Chicago, Ill.; G. J. Malone, Windsor, Connecticut; C. H. Meredith, Jacksonville, Fla.; W. B. Milliken, Denver, Colo.; C. D. Mitchell, Charlotte, N. C.; and H. L. Percy, Denver, Colo.

Utility men present were Campbell Wood, New York, and S. R. Kemp, Delaware, Ill.

The Kelvinator field sales representatives who came to Detroit were: E. E. Brammer, Dallas, Tex.; W. M. DeWitt, Louisville, Ky.; R. I. Eshman and

Jay Glaser, St. Paul, Minn.; C. B. Jones, Emporia, Kans.; S. A. Kelsey, New Haven, Conn.; J. B. Loomis, Minneapolis, Minn.; C. T. Smith, Dayton, Ohio; W. C. Stephenson, Chicago, Ill.; J. B. Taylor and R. M. Underhill, Plainfield, N. J.; E. V. Vinson, Indianapolis, Ind.; and George Wagoner, Jacksonville, Fla.

Kelvinator commercial representatives there were: A. P. Smith, Medford, Mass.; W. W. Blue and W. F. Keller.

Field service men at the Kelvinator meeting were: W. A. Arnold, Lexington, Ky.; J. H. Bennett, Detroit; Wallace Carrier, Chicago, Ill.; J. P. Dietz, Utica, Mich.; G. A. Eastman, Raleigh, N. C.; Harley Ferguson, Detroit; H. S. Gainer, Detroit; J. W. Granfors, San Antonio, Tex.; H. H. Jacob, Pittsburgh, Pa.; A. M. MacLennan, Omaha, Neb.; V. J. Martin, Detroit; J. M. May, Atlanta, Ga.; H. H. McGehee, Memphis, Tenn.; C. W. Ohman, Kansas City, Mo.; T. A. Ollila, Detroit; J. A. Powers, Peoria, Ill.; Wm. G. Reilly, Philadelphia, Pa.; Wm. A. Richter, Richmond, Va.; J. E. Scott, Indianapolis, Ind.; H. F. Sharon, Detroit; C. F. Sides, Charlotte, N. C.; Wm. Sluman, Seattle, Wash.; A. A. Smith, New Haven, Conn.; J. K. Stewart, Portland, Me.; F. W. Topping, Los Angeles; and H. Underwood, Detroit.

MOBILE RADIO COMPANY SELLS FRIGIDAIRE

Mobile, Ala.—The Mitchell Radio Service has been appointed Frigidaire dealer. The company has its headquarters at 14 North Joachim St.

VINING VISITS PORTLAND

Portland, Ore.—V. E. Vining of Evansville, Ind., general sales manager of Servel, Inc., conferred with Sam J. Lause, Northwest representative, and also with the officials of Harper-Megee, Inc., distributors, during a recent visit here.



**"Mr. Architect,
this refrigerator is insulated
with Dry-Zero . . . the most
efficient commercial insulant
known!"**

Architects—interested in *facts*, rather than *fancies*, respond quickly to this authoritative statement of quality.

DRY-ZERO CORPORATION, MERCHANDISE MART, CHICAGO, ILLINOIS

Canadian Office — 465 Parliament St., Toronto

DRY•ZERO

THE MOST EFFICIENT COMMERCIAL INSULANT KNOWN

LOS ANGELES FIRM OPENS NEW BUILDING

Los Angeles—Entering the refrigeration field as distributor in California, Arizona and western Nevada for Copeland, the Thor Pacific Co. has recently opened new sales and demonstration quarters at 1001 S. Hope St., here.

The new building covers 30,000 sq. ft. of floor space, including a full basement and two floors, in addition to sales and general offices.

A sales office is maintained in San Francisco by this company to handle northern California and western Nevada; another in Phoenix covers the Arizona territory, while the Los Angeles headquarters is the distributing point for southern California.

The new distributor plans to build its Copeland dealer organization from the list of 400 concerns to which it now distributes washers and ironers. Five Thor Electric Shops, selling at retail in Los Angeles, will also serve as Copeland outlets.

Evan O. Thomas heads the company as president and general manager. L. R. Swenson is sales manager; James H. Chambers, manager of the commercial division; John J. Slattery, sales manager for the Electric Shops division; L. L. McClelland, manager of the apartment house installation branch; and F. E. Hersey has been appointed Copeland service manager.

MERIDEN DEALER MOVES

Meriden, Conn.—L. W. Reynolds, Kelvinator dealer of Wallingford and this city, has moved his store here from 38 East Main St., where it has been located for the past two years, to much larger quarters at 1 Colony St.

Cecil E. Whitman is manager of the Meriden store.

Comedian Amuses Dealers at Meeting

Dallas, Tex.—With more than 70 regional officials, dealers and salesmen present, the annual district sales conference of the Frigidaire Corp. was held in the Baker Hotel, Feb. 27. J. P. Galloway, Dallas distributor, acted as host to the visiting dealers and salesmen.

H. C. Jamerson, of Dayton, Ohio, was unable to appear as speaker on Friday's program, due to a forced landing of the plane in which he was making the trip to Dallas.

The Friday morning session was a conference of dealers and officials only. Their discussion included: "Time Selling," "Proper Use of Show Windows for Display," "The Three Year Frigidaire Guarantee," "Sales Training," "Merchandising" and "Co-ordinated Effort as Related to the N. E. L. A. Electric Refrigeration Plan."

The chief speakers on the morning program were: J. P. Galloway, H. C. Stewart, southwestern regional manager, Ivan H. Wood, sales promotion manager for Galloway, Inc., and R. B. Ambrose, assistant manager, southwestern division.

Others on the program included F. F. Williams, sales promotion manager for the southwest; S. J. Best, factory service and installation manager, and A. E. Scheidt, of General Motors Acceptance Corp.

At the banquet in the evening much commotion was injected into the program by the belligerent and insulting actions of what appeared to be the head waiter, and who proved to be none other than Vince Barnett, nationally known Pathe film comedian. After his introduction, Barnett acted as master of ceremonies for a lively seven-act vaudeville revue.

At the conclusion of the Friday night banquet, awards were presented to sales-

Executives of New Grunow Group



M. W. Kenney (left) is the chief engineer in charge of designing and producing the Grunow electric refrigerators and radios which the recently organized Grunow Group hopes to market this year. James J. Davin (right) is the advertising and sales promotion manager of the organization. Other officers include William Grunow, Herbert E. Young, A. E. Winan, A. R. Perry, D. Jordan, C. Henry, and F. A. Delano.



men for outstanding sales work during the year 1930. Awards were presented by R. B. Ambrose to H. W. Wolverton, Sid Sale, S. C. Hagy, as Star B. T. U. Club members. Senior B. T. U. Club member awards were made to R. B. Bread and Tom Hagood, and Junior B. T. U. Club member awards went to C. B. Lay, C. M. Miller, Edgar Ware and Arthur Williams.

It was announced at the conference that the Dallas district led the United States and the entire world in the sale of Frigidaire equipment in 1930.

BIG OIL BURNER CAMPAIGN LAUNCHED IN WASHINGTON

Washington—A concentrated oil burner merchandising drive to tie in with spring building and modernizing activities was launched here March 10 at a mass meeting of dealers, salesmen and accessory distributors.

The drive, to last three months or longer, is backed up by an advertising campaign in the local newspapers and over the radio.

The campaign calls for a co-ordination of activities by oil burner dealers, fuel oil distributors, accessory manufacturers and the electric power company, and represents the most ambitious effort of its kind ever staged in Washington.

The advertising is conducted in the name of the Oil Heating Institute and the entire campaign has been devised with the advice and assistance of the Institute.

W. T. Johnson, formerly of the American Radiator Company, has taken charge of the administration of the plan, under the guidance of a committee appointed for the purpose, and the Kal advertising agency of Washington has prepared the copy.

Dealer activity is stimulated by special inducements to salesmen, and "pep" meetings will be held from time to time to report the progress of the drive. Architects, builders and home owners will be solicited with educational material.

C. M. Sharpe, executive assistant of the Potomac Electric Power Co., will explain the oil burner campaign in detail at the Philadelphia convention of the American Oil Burner Association on April 16. Mr. Sharpe will speak on "Electric Utilities' Co-operation with Oil Burner Industry."

WESTINGHOUSE REPORTS DECLINE IN 1930 SALES

New York City—Westinghouse Electric & Mfg. Co. reports total sales of \$180,283,579 for all classes of electrical merchandise during the year ending Dec. 31, 1930, as compared with sales of \$216,364,588 for the previous year.

Net manufacturing profit for the 1930 period was \$8,312,461, against \$21,992,601 for the year 1929. Gross income from all sources last year amounted to \$11,886,205, as compared with \$27,316,344 for 1929.

Reduction in sales and income in 1930, President F. A. Merrick states, reflects removal of manufacture of radio sets and tubes, as well as decrease in general business. The net earnings per share were \$4.45. As of Dec. 31, 1930, unfilled orders amounted to \$40,208,181, which compares with \$62,025,399 for the preceding year.

During the year four quarterly dividends were declared on the common and participating preferred stocks, each at the rate of 2½% (\$1.25 per share), a total for the year of 10% (\$5.00 per share).

JORDAN-MARSH SOLD 500 UNITS IN JANUARY

Boston—The Jordan-Marsh Co. Department Store sold 500 Kelvinator refrigerators during the month of January. Special advertising was employed and accounts of purchasers were carried on their regular charge ledgers or budget basis.

Although the smaller models were featured in advertising at an attractive price, the company reports that there was a demand for large models.

MANY HAZARDS MET IN MAKING NEW FILM

By Fred Bollmeyer

Cleveland—Dealers, distributors and salesmen attending spring conferences held in a number of cities by the Refrigeration Department of the General Electric Co., had the opportunity of witnessing the sound film, "The Trail Blazer," which was released at the fourth annual convention here a short time ago.

To obtain the atmosphere necessary to the purpose of the picture it was essential to find the proper location, vast sweeps of trackless, snow-covered valleys and mountains.

After scouring the Catskills for days, the directors decided to begin work in the Schoharie valley. There, equipped with snowshoes and skis and with the mercury constantly below zero, work was begun.

The title rôle called for a display of determination and grit of the old-time Trail Blazer. The man cast in this character donned the outfit of a frontiersman and started away through the snow, so deep that, without snowshoes, he would have floundered helplessly.

The Trail Blazer and others making the film tramped through mountain fastnesses, climbed the highest peaks and waded streams that flowed too fast to freeze.

Time and time again the cameramen cranked away at their machines when they knew that the slightest slip of one foot would send them hurtling down into a 500-foot chasm, deep with snow but bedded with rocks.

Several times it was necessary to tie the director and cameramen to trees on mountainsides to prevent them from falling or sliding to their death hundreds of feet below.

Despite the risks taken by these men, John Klenke, Lawrence Kroger, William A. Gluesing and other members of the company, only one was injured. That was Gluesing, who suffered a broken chest bone when his skis struck a log buried in the snow as he raced down a mountainside along the Sacandoga river.

Sound was not synchronized to the film until the crew returned to Schenectady because of the intense cold, in which sound apparatus would have been useless.

AHRENS REFRIGERATOR CO. HAS QUOTA OF \$1,500,000

Oklahoma City, Okla.—Oklahoma dealers in General Electric refrigerators showed an increase of 40 per cent in 1930 over 1928 business, records revealed at the spring conference held here recently by Ahrens Refrigerator Co.

Three hundred dealers and salesmen attended the two-day convention here.

Conditions as surveyed by Albert Ahrens, head of the company, show a better outlook for 1931 than in 1930. The company has a sales quota of \$1,500,000 for the year.

Nine dealers who were awarded recognition for outstanding sales records during the 1930 year were: Stone Hardware Co., Shawnee; Stephens Brothers Electric Co., Lawton; Fowler Music Co., Duncan; Marvin Davis, Bristow; Peterson & Austin, Guthrie; Smith Furniture, Seminole; Kinnebrew & Wood, Pauls Valley; W. D. Watts, Kingfisher; and Brinson Motor Co., Holdenville.

TEN DISTRIBUTORS ADDED TO NORGE ORGANIZATION

Detroit—The Norge Corp., subsidiary of the Borg-Warner Corp., has added 10 large distributors to its sales organization since Jan. 1, according to C. S. Davis, president of the parent company.

These new distributors are: Columbia Wholesalers, Inc., of Baltimore; The Sutcliffe Co. of Ohio, Cincinnati; Auto Equipment Co., Denver; W. M. Dutton & Sons Co., Hastings, Neb.; French Nestor Co., Jacksonville, Fla.; Reinhard Bros. Co., Minneapolis; Chapin-Owens Co., Inc., Rochester, N. Y.; Strevell-Paterson Hdw. Co., Salt Lake City; Onondago Auto Supply Co., Syracuse, N. Y.

HAWKINS SELLS OUT TO MADDOX BROTHERS

Birmingham, Ala.—G. B. Hawkins has sold his interest in the firm formerly known as Maddox & Hawkins, and is now connected with the Peacock Electric Co., in Mobile.

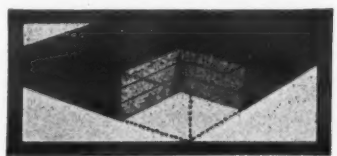
F. A. and W. M. Maddox will continue to operate the business under the name of Maddox Electric Co. The firm handles General Electric machines.

NEW RETAIL STORES

Cleveland—Frigidaire Sales Corp., 1371 Euclid Ave., has opened retail stores at 15405 Madison Ave., 13515 Euclid Ave., and 9947 Lorain Ave.

EFFICIENT

Balsam-Wool



Sealed Slabs

INSULATION

Turn to pages 50-51, *Saturday Evening Post*, March 21. See the first of the 1931 series of Balsam-Wool advertisements aimed at buyers of quality merchandise. Note how it stresses the real need of *true insulation* in the home... how it will convince consumers that *true insulation* means Balsam-Wool for refrigerators as well as houses. Watch how it will aid in stimulating a still greater public acceptance of Balsam-Wool lined refrigerator cabinets.

WOOD CONVERSION COMPANY

Mills at Cloquet, Minnesota

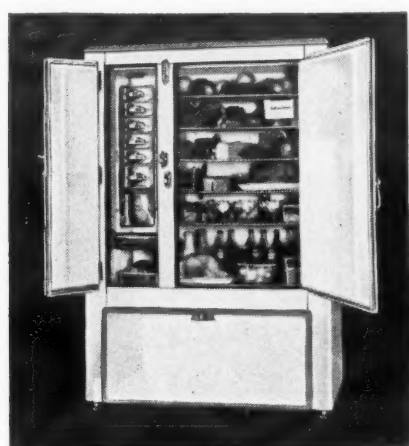
Industrial Sales Offices:

CHICAGO, 360 No. Michigan Ave. NEW YORK, 3107 Chanin Bldg. DETROIT, 3084 W. Grand Blvd.

Also manufacturers of Balsam-Wool Refrigerator Car and Steel Passenger Car Insulations; Balsam-Wool Insulations for Airplanes and Motor Buses; Balsam-Wool Acoustical Treatments; Balsam-Wool Building Insulation; Nu-Wood, the All-Wood Insulating Board and V-Joint Lath



purely
as a matter of
GOOD
BUSINESS



Kelvinator

(259)

C O U P O N

Kelvinator Corporation, 14245 Plymouth Road, Detroit, Michigan

Gentlemen: Please send details about the Kelvinator Sales Agreement

Name _____

Street Address _____

City _____

State _____

BEFORE a dealer enters into any electric refrigeration sales agreement he should get the facts *about all of them*. And then, he should base his decision on a careful, intelligent analysis of these facts. This is our suggestion to refrigeration dealers, and to progressive dealers in other lines who are going to add electric refrigeration. Get the facts.

»»

FIND out about the product. See if it reaches *every market*—the high, medium, and low-priced fields—as Kelvinator does. Kelvinator's list price range is from \$174.50 to \$755.00. With fifteen Cabinet Models, and a full line of units for equipping ice boxes now in use, it is a fact that *every prospect* for an electric refrigerator is a *Kelvinator prospect*.

»»

CHECK the sales features. See if any other refrigerator offers "World's Fastest Freezing Speed"; 4-Way Cold; Iso-Thermic Tubes; the Frost Chest; the Kold-Keeper; the Kelvin Crisper; and many other features that have given Kelvinator such widespread popularity and such enviable public acceptance.

»»

FIND out how long the refrigerator has been manufactured and how it has stood the test of time. See if *any refrigerator* can equal Kelvinator's seventeen years in electric refrigeration. Check the records of other refrigerators against Kelvinator's seventeen years of satisfactory service in the hands of owners. Ask Kelvinator owners about their Kelvinators!

»»

FIND out about the Commercial Line. See if any other manufacturer has a Commercial line that includes Water Coolers; Milk Coolers; Ice Cream Cabinets; Beverage Coolers; and a complete line of condensing and cooling equipment for every refrigeration need. Kelvinator commercial equipment is unequalled in efficiency. It represents an unlimited source of profit for Kelvinator dealers.

»»

GET the facts about the product—about the organization—about the policies. In this way *only* can you be sure you are making a wise, profitable selection. Complete information about Kelvinator is yours for the asking, without any obligation to you. May we hear from you? Send the coupon to-day.

KELVINATOR CORPORATION
14245 Plymouth Road, Detroit, Michigan
Kelvinator of Canada, Limited, London, Ontario
Kelvinator Limited, London, England

MERCHANDISING SECTION ELECTRIC REFRIGERATION NEWS

The Business Newspaper of the Refrigeration Industry

Published Every Two Weeks by

BUSINESS NEWS PUBLISHING CO.

550 Maccabees Building, Woodward Ave. and Putnam St.
Detroit, Michigan. Telephones: Columbia 4242-4243-4244

Subscription Rates:

United States and Possessions: \$2.00 per year;
three years for \$5.00

(Refrigerated Food Section only, \$1.00 per year)

All Other Countries: \$2.25 per year; two years for \$4.00
Advertising Rates on Request

F. M. COCKRELL, Publisher

GEORGE F. TAUBENECK, Editor

JOHN DRIFFLER, Managing Editor

JOHN T. SCHAEFER, Engineering Editor

FREDERICK W. BRACK, Advertising Mgr.

GEORGE N. CONGDON, Business Mgr.

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VOL. 5, No. 15, Serial No. 117, Part 1, March 25, 1931

Utilities and Price-Cutting

JUDGING from news reports published in this issue, it seems apparent that a new wave of attacks on public utilities is at hand. Politicians must have scapegoats, and periodically they "view with alarm" the ever-increasing size and strength of the "power trust."

In the past, legislative attacks upon the utilities have been directed against various phases of their structure. The last volley of indignation was aimed at holding companies. Comes now a series of assaults by state legislatures upon central station merchandising activities.

Oklahoma and Kansas have enacted statutes prohibiting utilities from selling household appliances. Similar bills are receiving committee hearings in Nebraska, Illinois, and California general assemblies. Another measure of this type was killed by the Nevada senate, after getting a favorable vote in the lower house.

Pro and Con

Reasonable arguments both for and against the merchandising of electrical appliances by central stations have been brought forth at these legislative hearings. The case for the utilities has been admirably stated by Mr. J. F. Owens, of the Oklahoma Gas & Electric Co., on Page 10 of this section. It is interesting to note, however, that a number of electric refrigeration distributors and dealers have favored the proposed legislation limiting merchandising by the utilities.

The biggest grievance against the utilities held by refrigeration organizations, answers to inquiries made among these men disclose, is that of price-cutting. In the opinion of ELECTRIC REFRIGERATION NEWS, there is no excuse for any central station to cut prices on electric refrigerators.

Competent Dealers

In the case of electric refrigerators, the central station's argument that it must do the merchandising or the machines won't be sold—which is true for many appliances—does not hold.

An army of competent dealers and salesmen, who have been and are doing a fine job of selling electric refrigerators, testify to the fact that the merchandising of electric refrigeration is in good hands and no longer needs trail-blazing.

Furthermore, it is to the best interests of the utilities to encourage and further the work of enterprising refrigeration sales organizations. When distributor and dealer organizations are highly organized, closely knit, and well equipped, central station merchandising departments cannot easily supplant these outlets in the business of equipping American homes and food stores with electric refrigeration.

Encouragement

The task of the public utility, then, should be that of encouraging and aiding these aggressive sales organizations, rather than that of undermining and discouraging them by cutting prices.

Even though some retail outlets have been cutting prices, the central station still is not justified in

underselling dealers who stick to list price quotations.

Essentially the job of maintaining and even raising the standards of the electrical appliance trade belongs to the power companies, and any merchandising practices which cause dissension in the ranks are surely not in keeping with the broad policies of industry uplift which the public utilities have established.

The eagerness of the central stations to speed the installation of more and more electric refrigerators can easily be understood and appreciated. Electric refrigeration is now counted the chief load builder among all electric appliances. It almost doubles the amount of power used annually in the average home. Moreover, it helps the central stations even up the peaks and valleys in their load curves—one of their biggest problems.

Co-operation

That public utilities as a whole realize that the major job in connection with electric refrigeration is to see that the units are installed, is indicated by the present N. E. L. A. co-operative plan to help the industry sell one million electric refrigerators in 1931.

For individual members of the highly integrated system of power companies to cut prices, and otherwise handicap the labors of electric refrigeration organizations toward raising saturation percentages, is in a measure to destroy both the spirit and the letter of the constructive policies established by the electrical industry as a whole.

GLEANINGS FROM RECENT PERIODICALS

"The Chairman then announced that the next subject on the program would be a discussion of the subject of merchandising, by Mount Taylor, chairman of the Merchandising Section. The Chairman stated that Mr. Taylor was one of the live wires in the ice industry in Texas, and that what he would have to say to them would be full of sound common sense.

"Mr. Taylor said that the ice industry was faced now with the most critical period of its entire existence. If the present competitive conditions are not met aggressively and constructively, if the many merchandising problems are not handled in the right manner in the next few years, he said, there would not be much of the ice industry left.

"The ice industry," he said, "was born and grew to maturity in an absolute monopoly in the field of refrigeration. The business grew and the more the public learned of the value of ice through experience with it, the more it was used. The ice industry itself was not responsible for this growth. The ice man drifted along with the current, making money with no constructive efforts on his part. With no constructive problems, no outside competition and no common cause to fight for in the ice industry, there developed internal strife, price wars and loss of confidence in each other.

"But when mechanical refrigeration came in, for the first time in the history of the world the public had the privilege of exercising its choice in the matter of refrigeration; for the first time in the history of the ice industry it found its progress blocked, challenged, face to face with opposition. Because of its lack of experience with competition, the industry had no adequate method of meeting this competition, and it has been wandering around in circles ever since. Many ice men started cutting prices, and general chaotic conditions in the industry ran wild.

"Today we are facing a brand new competitive situation. This competition is in the hands of one of the most powerful and aggressive modern selling organizations the world has ever seen. Every time a mechanical refrigerator is sold in an ice man's territory, it costs that ice man at least \$200. During 1929 over 600,000 domestic refrigerator machines were sold in the United States. Multiply that figure by \$200 and you have the stupendous sum of \$120,000,000. That is what this competition cost the ice industry in 1929. The yearly rate of these losses is increasing rapidly. This year they have set aside the enormous sum of \$5,000,000 with which to advertise and popularize mechanical refrigeration."—Report of Proceedings of Forty-first Annual Southwestern Ice Manufacturers' Association Convention held at Baker Hotel, Mineral Wells, Texas, February 4, 5 and 6, 1931, in *Ice and Refrigeration*.

A doctor was quoted by Sam West, Denver salesman, as saying that "If everyone knew what was most essential and important to their health and well-being, and they could afford but two good pieces of furniture in their home, this is what I would recommend: A good bed and mattress for the body to rest on, and a good mechanical refrigerator to keep food in. All the rest of the furniture does not matter, even if it is of the cheapest."

When the doctors are thinking this way—and they are—electric refrigeration may be considered to have definitely arrived as one of life's necessities.—*Kelvinator Cold Facts*.

Letters from Readers

What Is Synthetic Porcelain?

Chicago, Ill.

Editor:

On page 1 of the Feb. 25th issue of ELECTRIC REFRIGERATION NEWS there appeared a news item in connection with the Sanitary Manufacturing Co. of Fond du Lac, Wisconsin. In the body of the article there appeared this sentence:

"The food chamber is finished in white enamel, with the exterior of white synthetic porcelain."

We are wondering what the author of this article meant by "white synthetic porcelain." Doubtless the manufacturer of this refrigerator is using paint on the exterior of his box, but realizing the advantage of a porcelain enameled finish, is using the expression "white synthetic porcelain" to gain some attention.

At present there is, unfortunately, considerable misunderstanding with regard to the difference between painted exteriors on refrigerators and porcelain enameled exteriors, and we are naturally trying to point out the difference to the consumer.

All this may seem to be irrelevant as far as your publication is concerned; however, it is quite a problem in the porcelain enameling as well as the electric refrigeration industry, and we will be grateful if you will tell us what is meant by a "white synthetic porcelain."

GEORGE P. MCKNIGHT,
Director of Publicity, Porcelain Enamel Institute.

Kelvinator Sales Good In Boston

Boston, Mass.

Editor:

Sometimes when a customer shows undue hesitancy about signing up, saying that he does not know us very well, we call to his mind not only the scope of our national organization, but some few facts of what we have done in the Boston branch territory.

In apartment houses alone there are 233 buildings equipped with Kelvinator multiple systems. These 233 buildings contain a total of 5,928 suites. Most of these have been installed within the last two and a half years.

Besides that, we have 33 buildings equipped with Kelvinator self-contained units, with a total number of units between 400 and 500.

That gives some idea of the size and responsibility of our operation here just in the one department, namely, the apartment house division.

H. TROUTWINE,
Branch Manager, Kelvinator Sales Corp.

Legislation Against Public Utilities

Boston, Mass.

Editor:

Will you kindly send me by return mail a copy of the issue of ELECTRIC REFRIGERATION NEWS which carried the story on the legislation being proposed in California to prohibit utility companies from merchandising appliances?

I would also like to have a copy of this bill, together with a statement from you as to what other states may be planning similar legislation and what, if any, states already have it in effect.

HARRY S. GOULD,
Wetmore-Savage Electric Supply Co., Division of Westinghouse Electric Supply Co.

Compressors

New York City.

Editor:

I am wondering if some one in your organization can tell me what electric refrigerator manufacturers are now making their own compressors?

ARTHUR P. HIROSE,
Manager, Sales Promotion Dept., Electrical Merchandising.

They Like To Argue Out In Iowa

Des Moines, Iowa.

Editor:

Being associated with the electrical industry and a subscriber of long standing to ELECTRIC REFRIGERATION NEWS, I am asked to settle an argument concerning the sale of electric refrigerators, so am putting the question up to you, as I do not find available statistics to decide it.

The argument in question is: "Which company, General Electric Co., or Frig-

idaire Corp., sold the greatest number of refrigerating machines during the calendar year 1930?"

R. H. SAWYER,
Warde B. Stringham Co., General Electric Distributor.

Answer:

We are unable to settle your argument, since the manufacturers who have furnished figures to us have done so in confidence. We are not at liberty to divulge any information on the subject.

EDITOR.

Kind Words Department

Editor:

As we have taken on the Copeland refrigerator here, the jobber has recommended your NEWS as good information. Our jobber is the Fiske Radio Supply, Albany, N. Y.

VAIL-WILSON,
Wilmington, Del.

Editor:

I feel sure that you will receive a check from our company in a short time, and by all means do not discontinue the publication, which we consider a very interesting paper.

W. W. RHODES,
E. I. du Pont de Nemours & Co., Inc.
Des Moines, Iowa.

Editor:

We have recently been appointed distributors for Servel Hermetic refrigerators in the state of Iowa, and we believe your magazine will be of great help to us in the development of refrigeration business in this territory.

A. A. SCHNEIDERHAHN CO.,
Stoneham, Mass.

Boston Patriots Heed Call To Arms

Editor:

We were highly amused by the write-up of George F. Taubeneck regards his visit to Boston and Cambridge, Mass.

May we ask Mr. Taubeneck one question: "Who to heck was he with during his stay at the Parker House?" There was so much to see and he saw so little.

A. E. WARWICK,
A. E. Warwick Co.

Boston, Mass.

Editor:

It is quite apparent that even editors have something to learn. On page 4 of the Refrigerated Food Section of your issue of Feb. 25 you apparently tried to give Boston a boost, but we think you ended up in a miscarriage of ideas.

Although it is true that "we have dingy business buildings," this is the first time that we realized Boston is unique in being the only city with dingy business buildings. We actually have one or two that have been built in the last fifty years.

You mention that "traffic pace is slow"; "traffic volume is light," and "horse-drawn vehicles are very much in evidence." You don't see that in the streets very much in these days.

The next time you come to Boston the writer would like to take you for a ride. Undoubtedly you will go back home with the idea that traffic is not quite so slow and not quite as light as you thought.

You mention that in personal dress Boston is "contemptuous of modernity." We dress like "hicks" to fool the big butter and egg men from the West.

The writer is not looking for any publicity on this article, but thought that all editors are seeking new fields of information, and that this slant on Boston might help you correct some funny ideas you have been reading about.

E. A. TERHUNE,
President, Appliance Engineering Co.

Answer:

If another fan letter of this type comes in from Boston, I'll be convinced that the lens of my photographic brain must have been badly blurred during my short sojourn in the Center of American Culture.

My spirit is chastened. The next time I enter Boston it will be in a mood of humility and marked deference.

Inasmuch as the great part of the time I spend on my trips is occupied in tracking down stories for the news columns, the little impressionistic sketches of the various cities I visit must be written on the run. I saw Boston from a taxi-cab window, in much the same fashion that U. S. Marines see the world through a port-hole.

On my next trip to Boston I will surely seek Mr. Terhune and get that ride he has promised; although, being somewhat steeped in Chicago lore, I feel a bit of uncertainty in regard to his remark: "the writer would like to take you for a ride."

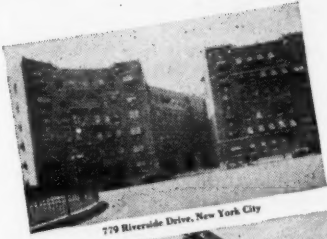
EDITOR.



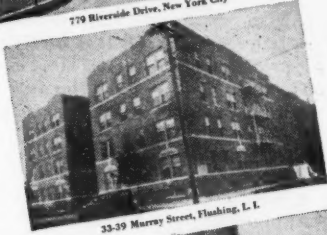
ADVANCED
REFRIGERATION

1000 Frigidaires

For Twenty-One Attractive Apartment Buildings
Owned and Operated by Goodley Holding Corporation



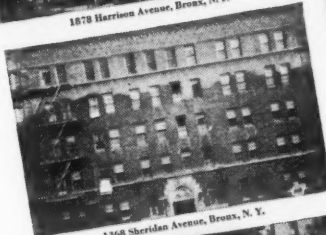
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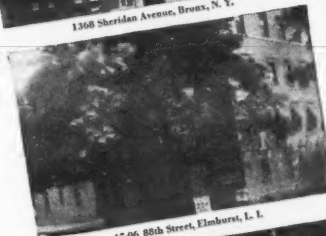
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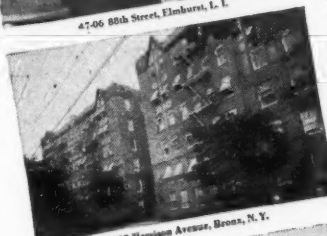
1878 Harrison Avenue, Bronx, N. Y.



1306 Sheridan Avenue, Bronx, N. Y.



47-60 85th Street, Elmhurst, L. I.



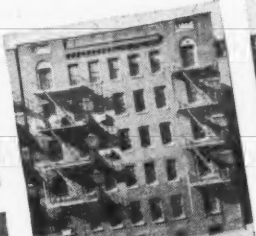
1899 Harrison Avenue, Bronx, N. Y.



3365 Devanter Avenue, Bronx, N. Y.



1886 Harrison Avenue, Bronx, N. Y.



1327 Grand Avenue, Bronx, N. Y.



1327 Grand Avenue, Bronx, N. Y.



1327 Grand Avenue, Bronx, N. Y.



305 East 23rd Street, Bronx, N. Y.



1349 Grand Avenue, Bronx, N. Y.



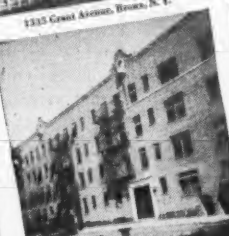
86-34 St. James Place, Elmhurst, L. I.



86-34 St. James Place, Elmhurst, L. I.



86-34 St. James Place, Elmhurst, L. I.



86-34 St. James Place, Elmhurst, L. I.

In placing his order for 1000 Frigidaires Mr. George Goodman, Vice-President of the Goodley Holding Corporation, writes: "We are enclosing herewith contracts for Frigidaire equipment for 21 of our buildings. We are exceedingly gratified with the performance and splendid service given by the Frigidaires in our 16 other buildings." . . . In Manhattan, the Bronx and Queens the many apartment buildings operated by the Goodley Holding Corporation are noted for the excellence of service to exacting tenants and modest rentals. . . . Frigidaire is saving money

for apartment house tenants throughout the world because it enables them to buy in larger quantities and also because Frigidaire keeps food fresher—longer. Come in to any one of our conveniently located showrooms and let us help you select the household model that best suits your needs, because when you stop to consider that for the past decade Frigidaire has been affording the maximum of refrigeration value, for you, too, there can be but one choice . . . Frigidaire.

Frigidaire
A GENERAL MOTORS VALUE
THIRTY-NINE WEST FORTY-FIFTH STREET, NEW YORK

MANY times each year newspapers carry Frigidaire advertisements similar to the one reproduced above—advertisements which tell a convincing story of an acceptance that has been won by performance. ● And now, following the introduction of the new all white

Porcelain-on-steel Frigidaires with their greater power and their three-year complete guarantee, Frigidaire dealers are experiencing the benefits of a still greater preference—a preference that is reflected in reports of record-breaking sales throughout the country.

FRIGIDAIRE CORPORATION, SUBSIDIARY OF GENERAL MOTORS CORPORATION, DAYTON, OHIO

Frigidaire
A GENERAL MOTORS VALUE

THE NEW ALL WHITE PORCELAIN-ON-STEEL FRIGIDAIRE ARE SOLD WITH A THREE-YEAR COMPLETE GUARANTEE

CENTRAL STATION MERCHANDISING

Oklahoma Executive Defends Appliance Sales by Utilities

By J. F. Owens

Vice President, N. E. L. A.; General Manager, Oklahoma Gas & Electric Co.

AN electric utility company is primarily a service company. Theoretically, at least, the public has delegated to its electric utility company the function of supplying them with electric service for the reason that the electric utility company is equipped to perform that service better in the interest of the consumer than they can themselves.

WHAT DOES SERVICE FROM AN ELECTRIC UTILITY COMPANY INCLUDE?

1. *Adequate and Reliable Service.* Involved in that service is, first, the furnishing to the consumer of an adequate and reliable supply of electric energy at lowest possible prices. But, the part of the electric utility company does not end there. It is not enough to furnish the consumer with an adequate and reliable electric supply at a fair price.

There is at least the implication that the utility company to which has been delegated the function of providing him with electric service, being as it is in the electrical business, has a better understanding of the applications of electricity to his needs than the consumer has himself.

2. *Information as to Uses of Electricity and Promotion of New Appliances.* There follows, then, the obligation on the part of the electric utility company

to bring to the attention of the consumer the uses and applications that he may make of electric service with benefit to himself.

It is, therefore, the duty of the electric utility company to keep the consumer at all times apprised of new developments and new utilizations of electricity, and of how these can be most effectively and beneficially used by the consumer.

In my opinion, it is not optional with the electric utility company as to whether it will bring these to the attention of the customer; it is rather a duty, actual as well as implied.

If the consumer is a washerwoman, earning her living washing clothes, and the application of electricity will make her life easier and enable her to increase her daily income through greater output, it is the duty of the electric utility company to bring this electrical equipment to her attention.

If it is a household whose breadwinner is a man of moderate means, who must conserve his resources and extend his earnings over the greatest possible range and still bring the greatest amount of comfort and convenience to his family, and a refrigerator will enable him to conserve food supplies and effect economies, it likewise becomes the duty

of the electric utility company to bring this to his attention.

Involved in all this is an accurate understanding not only of the consumer's needs, but the best adaptation of electricity to these needs.

3. *Quality of Appliances.* Experience proves that the public looks to the electric utility company for reliable and satisfactory service from the appliances which they purchase, and, therefore, the electric utility company must assume some measure of responsibility as to the quality and performance of appliances which its customers purchase. Continued customer satisfaction with each electrical appliance purchased is extremely important.

4. *Servicing of Appliances.* The electric utility company has an interest in the facilities that are available to customers for the servicing and repair of appliances after they have been installed and are in operation. Continued satisfaction to the customer from appliances promotes the purchase of additional appliances by him, and affects his attitude toward electric utilizations generally.

BRIEF SUMMARIZATION OF FOREGOING POINTS. It is the view of the electric utility companies that they have a definite responsibility to their customers, investors and the public generally with respect to electrical development.

This responsibility is not confined alone to rendering of adequate and reliable electric supply at fair rates.

This responsibility includes the research and development of applications and equipment for utilization of this service.

It includes promotion, advertising, and such activities as are necessary to public understanding and acceptance of utilizations to which electricity may be put.

It includes some responsibility for the character and quality of electric appliances offered to the public.

It includes consideration of facilities for servicing appliances in order that they may continue to render useful service.

DECISION OF THE PENNSYLVANIA COURTS DEALING WITH THE ABOVE ASPECTS. These relations of the electric utility companies to their customers are discussed in a decision of the Court of Common Pleas of Pennsylvania, afterward sustained by the Pennsylvania Supreme Court, a pertinent paragraph of which reads:

"The public had not been educated with regard to the multitude of conveniences which the electric current will supply. To furnish the housekeeper with the electric current alone would have resulted in neither profit to the company nor convenience to the customer. What the latter wanted, and what the legislature intended to grant when it authorized the respondent to furnish light, heat and power by electricity, was something more than furnishing the customer with the end of an insulated copper wire, that he did not know how to use, or had not the appliances to use. It was intended that he should have and the company should furnish the conveniences that could be obtained by the use of the electric current."

LOWER RATES TO HOUSEHOLD CONSUMERS DEPEND ON LARGER USE. There is a definite relation between the quantity of electricity used, the time it is used, and the rates at which the electric utility company can furnish its service to its customers. The reasons for this are:

The average electric utility company makes large investments to meet a demand on its system, which is now being utilized, on the average, perhaps, less than four hours a day, and consequently but a few hours a year.

Obviously, it must maintain generating capacity, distribution facilities, and an operating force necessary to meet the maximum demands that may occur at any hour or time.

There are certain costs, such as reading meters, billing, fixed charges on investment, general overhead, which are incurred for each customer, whether he uses a large or a small quantity of electricity or none at all.

Any uses of electricity that can be developed which work the plant facilities at times aside from the hours of peak demand involve relatively small additional expense.

Obviously a utilization of its service for any part or all of the twenty unutilized hours of the day, aside from peak demand, will add to the net income of the company and will prove a decided factor in its ability to reduce rates to all of its customers.

In one electric utility company with which I am familiar, the average kilowatt-hour consumption per domestic consumer increased from 334 kilowatt-hours per year to 456 kilowatt-hours per year. This company felt justified in making a reduction in the domestic rate of 17½%, and it was able to do this without impairment of its net. It was the in-

creased use of electricity in the home which made possible this reduction.

All of this is suggested with the thought of emphasizing the fact that utilization of electricity in the home, through promotional sale of electrical appliances is indisputably interwoven with the ultimate cost of electricity to the domestic consumer.

To put it in another way, it is a sort of endless cycle. Increased utilization of electric service by domestic consumers means decreased rates; decreased rates mean increased opportunity to these electrical consumers to utilize electric equipment; and this inevitably opens up a wider market for the sale of electrical appliances.

THE PARTICULAR CHARACTERISTICS OF ELECTRIC UTILITY COMPANY BUSINESS. It must not be forgotten that the electric utility company cannot sell or offer to sell kilowatt-hours as groceries, clothing, or other articles of merchandise. There must first be sold to the domestic consumer a current consuming appliance or equipment before it can sell kilowatt-hours, which is our main business.

Obviously, expansion in the sale of electricity, and the performance of the utility company with respect to both its customers and its investors, is closely linked up with progressive sale of appliances utilizing electrical energy.

ELECTRIC UTILITY COMPANY'S RESPONSIBILITY TO ITS INVESTORS. In order to render an adequate, dependable electric service, the electric utility company is required to make large investments in generating, transmission, and other facilities for rendering service.

This investment is shared in by millions of investors to whom the utility company management has a very definite responsibility in aggressive and progressive electrical development which will insure adequate enough returns on this investment to continue to attract the large sums of new capital annually required to take care of the demands of all of its customers.

The longer hour use of electricity by the 20-odd million domestic customers now served is looked upon as perhaps the most important single field for expansion in utilization of the facilities in which this money is invested.

This investment is of such proportions that the utility company cannot, in my judgment, be fairly called upon to relinquish its responsibility to the investor of assurance that this potential domestic business will not be vigorously developed.

PROMOTION OF ELECTRICAL APPLIANCES BY UTILITY COMPANY OF BENEFIT TO OTHER MERCHANTS. It is the viewpoint of many electric utility companies that their continuance in the merchandising business, particularly of those appliances which are in the promotional stage or have not yet reached general public acceptance, is of extreme value to other merchandisers of electric appliances in the community in opening up and widening their potential markets.

General experience proves that vigorous merchandising by the electric utility company on recognized merchandising basis, actually stimulates and increases the volume of business accruing to other merchandisers.

There are few, if any, localities in the country where the merchandising of electric appliances by the general merchandising trades without the electric utility company has reached that stage where they can alone be depended upon to secure popular utilization of electrical appliances.

SMALL TOWN AND FARM—DIFFERENT SITUATION THAN IN URBAN CENTERS. The relation of the electric utility company to its customers in promotion and stimulation of electrical utilizations in the small town and farm areas has certain aspects which are different than those in larger metropolitan centers.

Electric service has extended to practically every town and village and is rapidly extending to the farms. The interests of the customer of the utility company in small towns and on farms must always be kept in mind in these considerations.

In a large proportion of smaller communities, the utility company provides the only substantial facility to the public in connection with electrical appliances and their servicing.

FUTURE POTENTIAL MARKET. In 1930, the average use of electricity in the homes of the country was 550 kilowatt-hours per year. It has been estimated that a completely electrified home of average size may profitably utilize 8,000 kilowatt-hours per year.

Consequently, it may be said that today, the average home in the United States is only about 7% electrified. As illustrative of this, in the February 5, 1931, issue of "Public Utilities Fortnightly," it is estimated that complete electrification of homes in the United States would involve the purchase of some twenty-four billion dollars' worth of electrical appliances by the twenty

million electric domestic consumers now served.

This, of course, is an ultimate goal. But if only 25% electrification of homes were reached, there would be involved the purchase of six billion dollars' worth of electrical appliances.

The foregoing is on the basis only of existing household appliances and does not take into account future uses some of which are already far enough progressed in laboratory development to give indication of utilization in the not far distant future.

Nor does it take into account new homes which will be added, with normal increase in the nation's population; nor does it take into account replacements of these appliances which, once their acceptance is assured will offer a tremendous field for merchandising activities when promotional work is completed.

This gives some visualization, as we electrical men view it, of the enormous possibilities lying open to all those interested in merchandising electrical appliances and equipment in the immediate future.

MISIMPRESSION AS TO PROPORTION OF MERCHANDISING DONE BY ELECTRIC UTILITY COMPANIES. An erroneous impression, we believe, exists as to the volume of total electrical merchandising for the country as a whole which is actually done by electric utility companies. Best information obtainable is that of the total volume of sales in household electrical appliances in 1930, the electric utility companies did approximately 30%.

The sale of ranges, refrigerators, and water heaters accounts for a substantial proportion of this 30%. It is estimated that of the over-the-counter merchandise sold by the electric utility company (the smaller heating and the motor driven devices which are sold also by the general merchandising trades), amounts to no more than 15% to 20% of the total volume.

In larger cities, utilities sell as low as 15% of the total electrical household merchandise, although the proportion in the smaller towns, upon which a particular burden of responsibility falls on the utility company, the proportion may rise as high as 40% of the total volume.

PROPER COORDINATION NECESSARY. The real job is one of proper cooperation. The enormous future volume of electrical merchandise which it will be possible to sell to the people of this country, and the relatively small proportion of the volume which will be sold by the electric utility companies, as indicated by the past year's performance, shows that our major problem is one of developing cooperation between all of those interested along the lines of seeing how we can mutually work with each other to develop this enormous potential business.

SERVEL, KELVINATOR ADD LOS ANGELES DEALERS

Los Angeles—The H. R. Curtis Co., with headquarters at 1145 Wall St., here, and 895 O'Farrell St., San Francisco, has been appointed distributor in California for the Servel-Hermitec line.

The Kelvinator-Los Angeles Co. has just named L. S. Mogi, 206 S. San Pedro St., as associate dealer in the Japanese section of the city.

The National Carbonic Machinery Co., of Chicago, manufacturers of large refrigerating plants for buildings, also air cooling and conditioning systems, has opened offices here at 318 West Ninth St., with O. A. Labus, secretary of the company, in charge.

POWER SERVICE EXTENDED TO 74 MICHIGAN CITIES

Ann Arbor, Mich.—Seventy-four Michigan communities which previously had no central station electric power service were connected with the lines of the state's power systems during 1930, according to a survey just completed by the Utilities Information Bureau here.

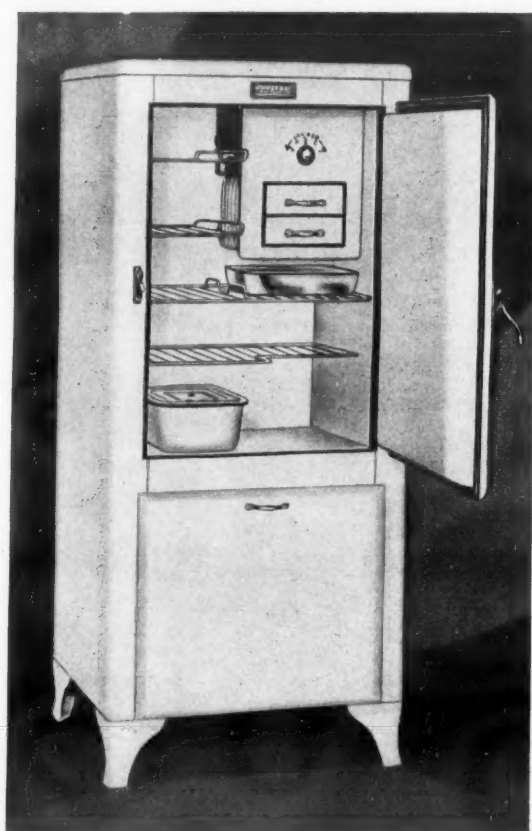
The seventy-four communities using central station service for the first time are scattered throughout the state. Sixty are in the lower peninsula and 14 in the upper peninsula.

Less than 200 Michigan towns of 100 population or more are now without central power service, and most of these are in isolated locations out of present reach of system transmission lines.

CONTEST RESULTS IN SALES OF 122 MAJESTICS

St. Joseph, Mo.—The St. Joseph Railroad Light, Heat & Power Co., handling Majestic refrigerators here, recently closed a contest in which 122 Majestic refrigerators were sold in three months.

The sales staff was divided in two crews of six men each, with Jerry Whitwell and John Bachman as leaders.



Universal Cabinet No. LP-5. A 5 cu. ft. self contained model.

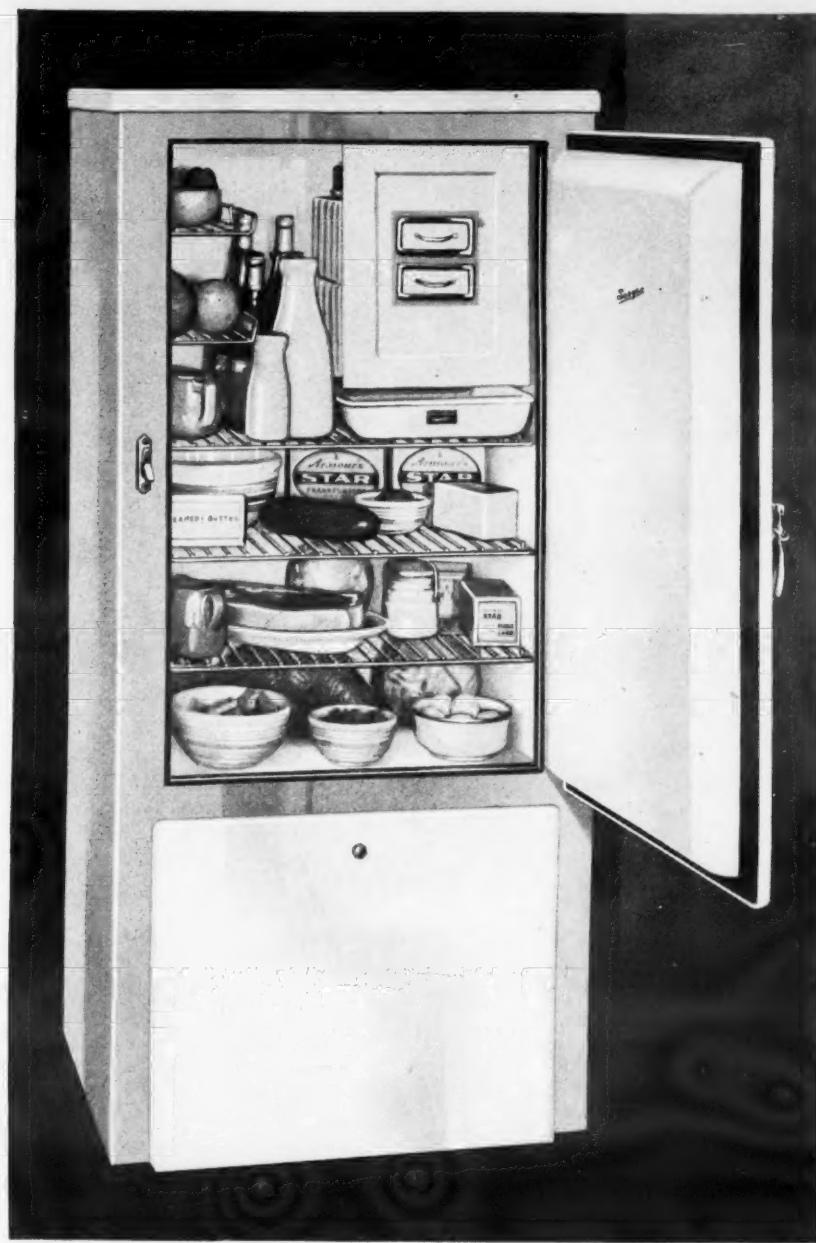
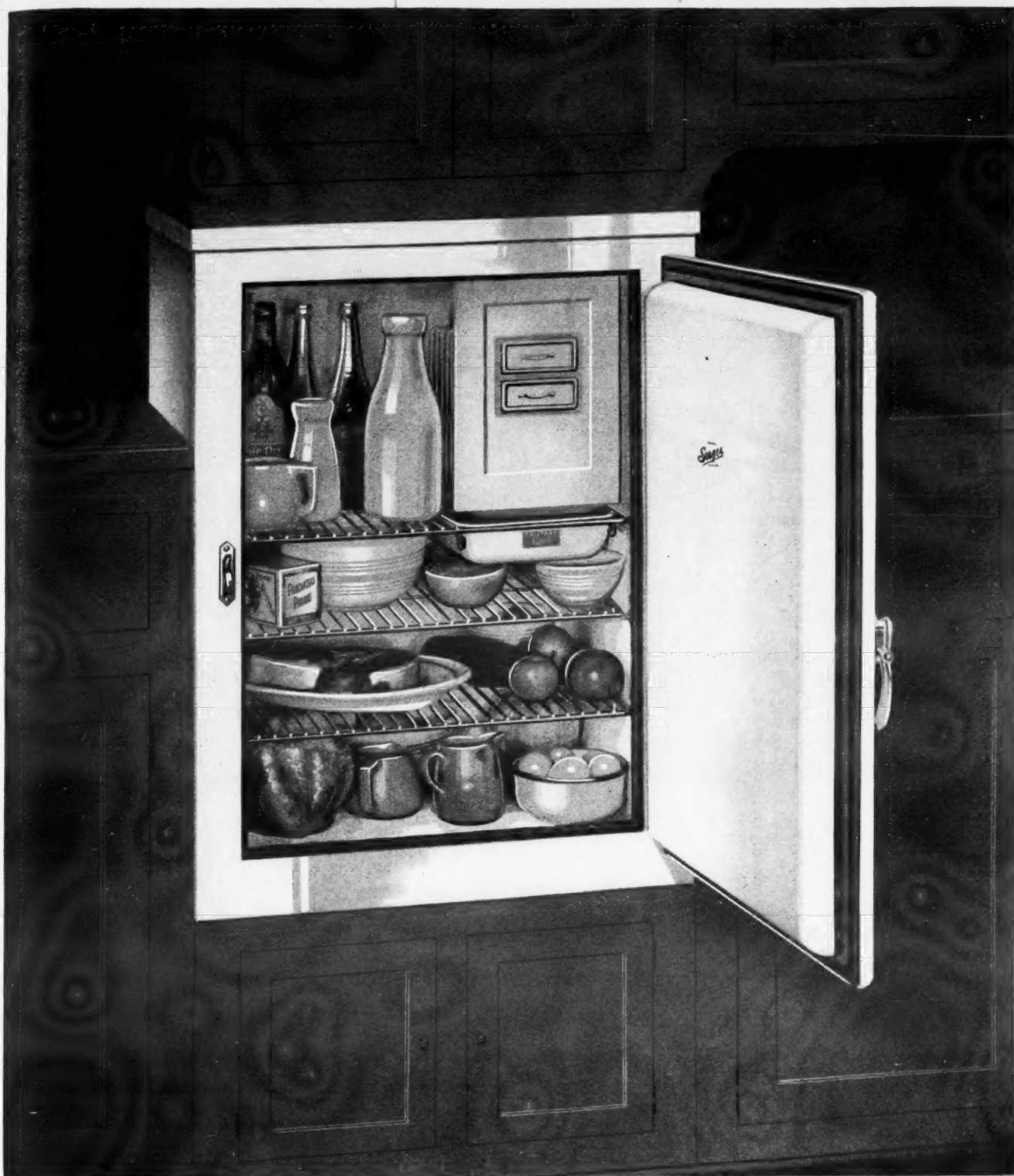
Universal Coolers offer high quality at low cost

UNIVERSAL dealers find sales easy to make in these days when people are demanding unusual values for their money—for the Universal Line of self-contained cabinets are equipped with the ever dependable and economical Universal Compressors and possess every desirable feature including Refresh-O-Pan, cold regulator, porcelain interior, massive chromium plated hardware, one rubber tray, 5" legs and unusually attractive prices.

Complete information upon request.

Universal Cooler Corporation

Detroit, Mich. - - - Windsor, Ontario, Canada



APARTMENT CABINETS BY *Seeger* SAINT PAUL

The determining factor in many an extensive refrigeration Cabinet sale has been the Seeger name-plate—with its never failing assurance of uncompromising quality and incomparable value—every characteristic detail an undisputed Refrigeration Cabinet Standard.

The Apartment Refrigeration Cabinets illustrated are of all porcelain, interior and exterior—incorporating highest type construction, specially designed chromium plated hardware and adequate insulation, resulting in maximum service at minimum maintenance cost.

These Cabinets are available in 4 or 5 cubic feet capacity with compressor compartments, without legs or with legs. Height of legs 4, 6, 8 or 11 inches, filling any requirements.

Apartment Refrigeration Cabinets by Seeger in lacquer exterior finish available in 3, 4 or 5 cubic feet capacity.



In the illustrations is included a composite low-side (cooling unit) to which is attached a porcelain front. This arrangement has been illustrated for appearance only—this is regularly furnished by those supplying the electrical machine equipment, and not by the Seeger Refrigerator Company.

SEEGER REFRIGERATOR COMPANY

Madison Ave.,
Between 46th and 47th Sts.
NEW YORK, N. Y.

655-57 So. La Brea Ave.
LOS ANGELES, CAL.

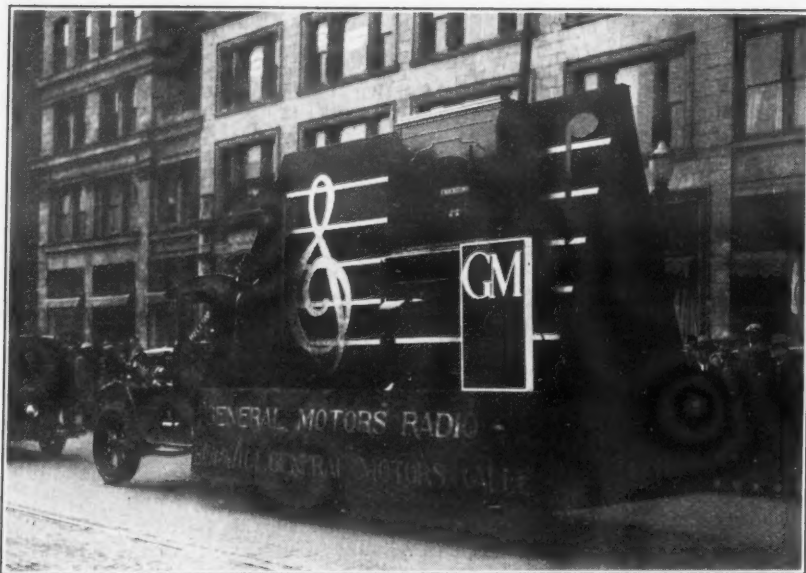
Statler Building
BOSTON, MASS.

660 North Wabash
CHICAGO, ILL.

RECEPTION COMMITTEE MEETS FRIGIDAIRE B.T.U.'s



G. M. Radio Float



Dayton citizens turned out en masse March 16 and 17 to help home office officials and members of the Trip-to-Dayton division of the B. T. U. club celebrate the tenth anniversary of Frigidaire Corp. activities in Dayton.

Flags were flown, the city fire and police departments turned out in force, and townspeople lined the streets as the star salesmen paraded through the heart of town.

Other General Motors organizations, including the G. M. Radio Corp. and General Motors automobile dealers throughout the city, participated in the parade. Pictures on these pages were taken during the celebration.

QUEEN



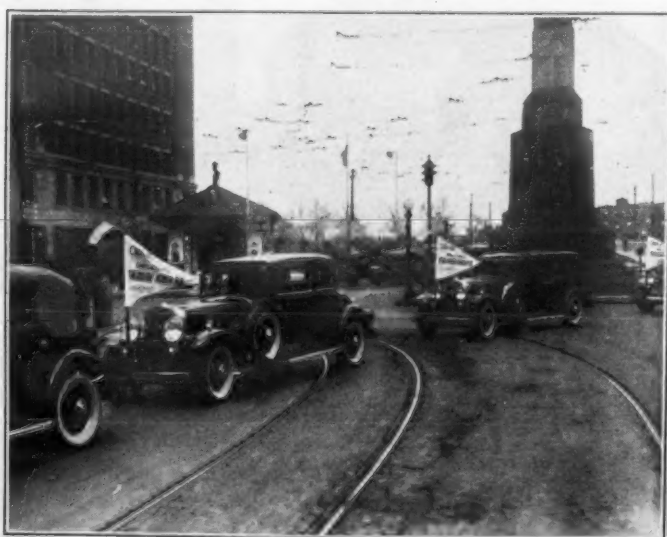
Sales Manager and Publisher

Heart of Demonstration



Doris Herlig, who was once one of Flo Ziegfeld's "glorified American girls," was the Queen of the anniversary. She is pictured in her regal robes in the center of this page. Miss Herlig was also the star of the musical revue which was staged for the visiting salesmen.

Auto Dealers Join Parade



General Motors automobile dealers carried the star salesmen and guests in their latest car models during the big parade.



J. D. Harlan (left) and F. M. Cockrell.

Escort Clears Path



A police escort and fire trucks cleared Dayton streets of traffic while the Frigidaire B. T. U. Club rode through town.

EXPORT INFORMATION ON POLAND

Refrigeration Makes Progress in Large Polish Cities, Towns

By J. Klahr Huddle
American Consul General, Warsaw, Poland

POLAND possesses an underdeveloped electrical system, with only the larger cities and towns maintaining power houses; and as a result the use of electrical current for household labor saving devices, or for what are still regarded in Poland as luxury purposes, has not yet begun to show important development.

It is only within the last two or three years that household electrical appliances in important quantities have appeared on the Polish market, but as yet this movement has been practically confined to the larger cities. The electric refrigerator has been the latest item in this class to make its appearance in Poland, and the one American company represented in this line is reputed to be doing a small but gradually increasing business.

Aside from the present economic depression, probably the greatest obstacle to larger sales of electric refrigerators in Poland is their high price, which makes them available only to the wealthier classes of people living in the larger Polish cities.

There is no manufacturing of electrical household refrigerators in Poland.

Economic Situation

Poland has been undergoing a difficult transitional period in regard to its economic situation. Trade in many articles is small, and business is also conducted on a credit basis which might not appeal to you.

It would seem inadvisable to extend credits to Polish firms at the present time, unless it is known that they are deserving of such consideration after a thorough investigation of their business and financial standing.

Further, caution should be exercised in entrusting the collection of C. O. D. charges and care should be exercised in dealing with banks and forwarding agents.

There is only one type of electric refrigerator being sold in Poland at the present time. This particular type is a well known American make.

It is understood, however, that other manufacturers of electrical refrigerators are endeavoring to enter the Polish market.

Few Imported

Polish foreign trade statistics do not separately specify imports of household electrical refrigerators. However, the total number brought in during the year 1930 is presumed to be quite small.

Under the customs classification of "Machines and Apparatus for Making Ice and Refrigerating Purposes," Polish imports during 1929 are officially valued at 444,000 Polish zlotys (approximately \$48,840.00), and 420,000 Polish zlotys (approximately \$46,200.00) in 1930.

This classification is understood to include both electrical and non-electrical ice-making and refrigerating apparatus.

There seems to be no special preference as to the make or country of origin of electric refrigerators such as are used in the United States.

Electric Current in Poland

The problem of varied current must be considered by foreign manufacturers of electric refrigerators when entering the Polish market.

An idea of the extent to which current varies in Polish cities may be seen from the following tabulation, which indicates the voltage and current supplied by various Polish power houses:

Warsaw	A.C.	3 phase	120 Volt and
	A.C.	3 phase	220 Volt
Poznam	A.C.	3 phase	220 Volt and
	D.C.		220 Volt
Krakow	D.C.		220 Volt
	D.C.		150 Volt and
	A.C.	3 phase	220 Volt
Lodz	A.C.	3 phase	120 Volt
Wilno	D.C.		220 Volt

A recent instruction of the Polish authorities endeavors to stabilize the current in Poland by requiring all new power plants to use 1x220 or 2x220 volts D.C. or 1x220 volts A.C., three phase, fifty cycles.

All existing power houses will be permitted to maintain their present rating, which also may be used on extensions and new lines powered by them.

Sales Methods

Foreign electrical household appliances and equipment are sold on the local market almost exclusively by authorized distributors and representatives, who either have warehousing facilities or who can get prompt shipments from the factories.

A few of the larger concerns working in the electrical line possess fairly good warehousing and display facilities, including traveling salesmen, who cover the whole of Poland.

important also. Electrical equipment in general according to reports of the trade, is being imported from Germany on credit ranging up to two years. In some meritorious cases credits up to three years are extended.

Distributors and dealers must sell such equipment against long-dated acceptances or on a 10 to 16 months installment plan.

Practically no concern in Poland today is prepared to do business on a cash basis, having very limited financial resources of their own, with local banks being unable to assist them except at prohibitive rates, the dealers are forced to seek external aid for the financing of sales.

It may be said that they have become accustomed to look to the foreign manufacturer or exporter for aid in this respect.

Consequently the chances for such a manufacturer to do business in Poland on a satisfactory scale center entirely on his ability to place before local distributors a plan for financing sales sup-

ported with external credit accommodations.

Pumps and compressors for use in ice making machines and refrigerators are classified according to Article 161, Paragraph II, of the Polish Import Tariff, which prescribes the following normal and conventional duties in Polish zlotys per 100 kilograms:

	Normal	Conventional
a) 120 kgs. and less.....	22.00 (\$ 2.47)	187.75 (\$21.08)
b) 120 kgs. to 300 kgs.....	175.50 (\$17.47)	149.17 (\$16.78)
c) 300 kgs. to 750 kgs.....	143.00 (\$16.06)	121.55 (\$13.65)
d) 750 to 1,500 kgs.....	110.50 (\$12.41)	93.22 (\$10.43)
e) 1,500 to 3,000 kgs.....	91.00 (\$10.23)	77.35 (\$ 8.50)
f) Over 3,000 kgs.	71.58 (\$ 7.87)	60.77 (\$ 6.68)

Conventional duty is applied to American goods if imported directly into Poland via Danzig or Gdynia, with a certificate of origin certified to by Polish consular authorities in the United States.

Shipping Facilities

Merchandise from the United States is principally shipped to Poland via

Danzig, and price quotations usually are c.i.f. that port.

However, the port of Gdynia is being rapidly developed by the Polish authorities, and adequate railway facilities provided to Warsaw.

Merchandise may as a result be now quoted c.i.f. Gdynia, and consideration given to direct shipments to that port

from the United States.

The national language is Polish, but German, French and, to a less extent, English, are used commercially.

Correspondence, catalogues and literature may be written in these languages when directed to merchants in this district, although correspondence and catalogues (Concluded on Page 20, Column 1)

Simplest

ELECTRIC REFRIGERATOR

ever produced

THE NEW

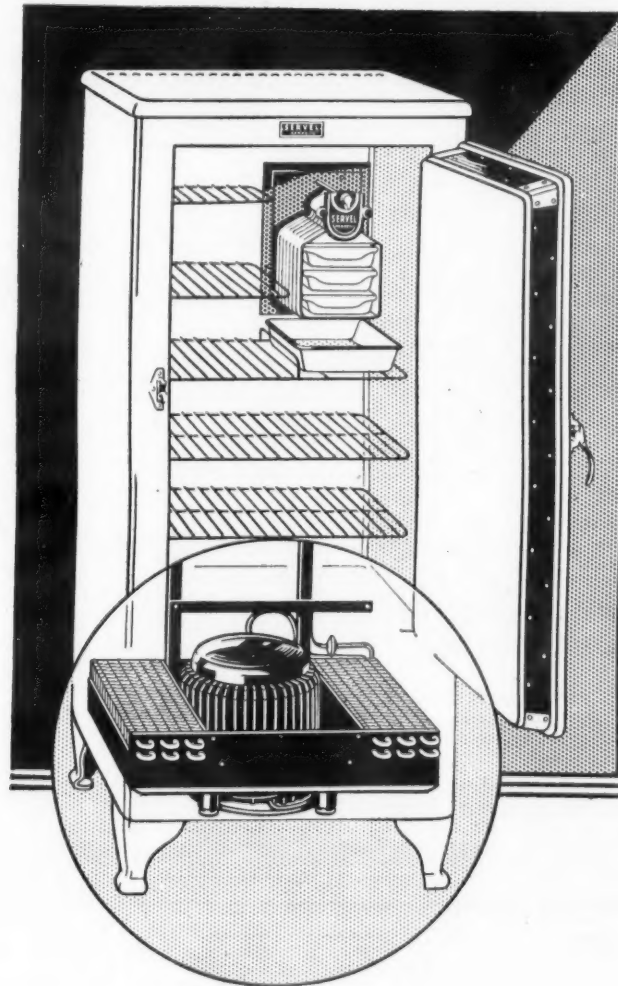
SERVEL

HERMETIC



Simplified Refrigeration

Did you read the last Servel advertisement in the March 21 Saturday Evening Post? The next in this powerful series appears April 18. Watch for it!



YOU don't have to be a mechanical expert to appreciate the extreme simplicity of the new Servel Hermetic.

Take a look at the unit. It requires fewer moving parts than other electric refrigerators—fewer chances for friction and wear. And all parts most likely to cause future trouble have been discarded entirely.

The whole unit is placed in the base of the cabinet—out of sight, out of the way. It's hermetically sealed in a permanent bath of oil—to eliminate old-fashioned Service problems.

No Service Department

Now you can sell electric refrigeration without maintaining a costly repair shop.* No more repairs in the kitchen, no intricate adjustments or replacements of parts.

Your original profits are safe... instead of being eaten up slowly

and surely by Service expense.

You can promise your customers "care-free", dependable refrigeration for the fewest possible cents a day. The Servel Hermetic costs considerably less to operate. And it's the quietest electric refrigerator, as shown by scientific tests.

Dealers who handle the Servel Hermetic are perfectly equipped for a busy and profitable selling season—whether the general business recovery is rapid or slow.

Beautiful, compact cabinets in a full range of sizes at prices every family can pay. A factory guarantee that protects both dealer and purchaser. National advertising in full colors, so striking and vivid that it directs scores of interested prospects to your display. What tremendous profit possibilities are ahead!

Write today for full details of the attractive dealer set-up that insures more profitable business for you.

SERVEL SALES, INC., Evansville, Ind.
MANUFACTURERS OF A COMPLETE LINE OF
HOUSEHOLD AND COMMERCIAL REFRIGERATION

*If repairs should ever be necessary, simply replace the unit (a simple, one-man job that requires no tools except a screw driver) and ship it to the factory at Evansville for prompt repairs.

PITTS CO. REPLACES MAJESTIC BRANCH

Boston—F. D. Pitts Co. has taken over distribution of the Majestic line of refrigerators, together with other products of the Grigsby-Grunow Co., in Maine, New Hampshire, Rhode Island and eastern Massachusetts.

The Boston branch of the Majestic factory has been closed. The Pitts Co. formerly handled Majestic products until the local factory branch was opened in Boston.

Stern & Co., Inc., which handles Majestic products for Connecticut and western Massachusetts territory, has opened its Boston branch, as far as handling Majestic products are concerned.

BELSEY TO SPECIALIZE IN ELECTRIC APPLIANCES

Los Angeles—Addition of a complete line of electrical appliances has been made by George Belsey Co., General Electric refrigerator distributor for southern California, to test the feasibility of retail specialization of electrical appliance merchandising.

Appliances which were added by the Belsey company include the General Electric ranges, radios, washing machines, vacuum cleaners and table appliances.

Previous to the advent of radio and refrigeration, dealers reported that it was not practicable or profitable to operate a store dealing solely in electrical appliances.

DISTRIBUTOR IN TOLEDO OPENS NEW RETAIL STORE

Toledo, Ohio—The H. G. Bogart Co., distributor of General Electric refrigerators, will open a new retail store in this city March 15.

The new store will be at 312 Superior Street, in the heart of the downtown district, and is on the ground floor of the Board of Trade office building, in which the company has its general offices.

It was reported by Mr. Bogart that the Toledo organization had a 30 per cent increase in sales in 1930, despite the depression in general business. He believes that this year will find an even greater per cent of increase.

RADIO DISTRIBUTOR ADDS SERVELS

Baltimore, Md.—The Joseph M. Zamolski Co., Radiola distributor, with headquarters at 111 West Redwood St., has been appointed distributors in this territory for the Servel refrigerator.

In addition to Baltimore territory the company covers all of Maryland, the District of Columbia, and parts of Virginia and Pennsylvania.

Sliding Shelves in New G. E.



Housewife tries new refrigerator convenience

MAY NOW ASSISTANT TO WESTINGHOUSE PRESIDENT

Pittsburgh—Appointment of Herbert A. May as assistant to the president has been announced by F. A. Merrick, president of the Westinghouse Elec. & Mfg. Company.

Mr. May's headquarters will be in Pittsburgh, where the offices of the Westinghouse central sales district are located.

The new assistant is a director of Mackintosh-Hemphill Co., Union Drawn Steel Co., Davidson Ore Mining Co., Pittsburgh Steel Foundry Corp. of Buffalo, N. Y., Forbes National Bank of Pittsburgh, the Pittsburgh & W. Va. R. R., and the Farmers National Bank of Beaver Falls, Pa.

NEW NORGE DISTRIBUTOR

Roanoke, Va.—Columbia Wholesalers, Inc., of this city, has recently added Norge electric refrigerators to its line.

India Good Market, Says Export Man

By Earl J. Black

Note: Earl J. Black, special representative of the H. M. Robins Co., Detroit, Mich., exporter of Copeland electric refrigerators, has recently returned after a year's trip through India, Ceylon and Egypt. He spent more than eight months in India and visited almost every section of that country.—Editor.

THE refrigerators that we are now selling in India, Ceylon and Egypt are mostly of the domestic type. But I believe that the big future for electric refrigeration in these countries will be in the commercial field.

Until electric refrigeration was introduced into these countries, preservation of fresh food of any kind was impossible. Of course, the natives never enjoy any such luxuries, rice and curry being practically their sole form of food.

The tea and rubber plantations and mines are in all cases managed by Europeans. Each place has a manager and an assistant, both of whom are married and live in bungalows with their families. These bungalows are provided with electric refrigerators because there is no ice outside of a few of the large cities where there may be one or two plants manufacturing it. A cold drink is unheard of.

First Commercial Installation

To the best of my knowledge the first commercial installation of electric refrigeration in Colombo, India, was a Copeland. It was in a walk-in type of cooler.

There are two large cold storage plants in this city which make and store frozen foods. There are a few commercial installations, also, in main centers like Calcutta, Bombay and Madras, the only places where I found mechanical refrigeration.

Colombo is a big town and imports practically all its foodstuffs. These come chiefly from Australia and New Zealand. Fruits are imported from California in large quantities.

Fresh meat and fruits are shipped to the large cities. Once a week a trip is made to these centers by managers of plantations and mines and supplies of fresh meat and fruits are bought to last for the week.

These are rushed to the refrigerators at the mines or plantations so that they will not spoil in the hot climate. This makes it possible for them to have fresh fruits and other food. The meat is mostly chicken. The fresh killed fowls are sent out from the large centers once a week.

There are no sources of electric power outside of the large cities and the refrigerators are operated by private power plants installed on the plantations or at the mines.

The coolie is the laboring class, and so far none of the benefits of electric refrigeration are open to him. He gets a banana leaf and receives a helping of rice and curry.

High Cost of Ice

Just to give you an example of how rare ice is in India, I paid twelve annas in Indian money, which is about twenty-five cents in American money, for only enough ice to cool a glass of soda water. The soda water cost only two annas or four cents.

Business conditions in India were badly unsettled by the recent "civil disobedience" campaign. Bombay was the center of the congress led by Gandhi and business there was considerably hampered.

The business men did not approve of Gandhi because he was seriously interfering with business. This was not because Gandhi was antagonistic to business interests; but in the attempt to boycott British goods, pickets were placed in front of all business establishments that sold British merchandise.

HOLBROOK ADDS TWO RADIO DISTRIBUTORS

Los Angeles—Two prominent radio jobbers, Pacific Wholesale, Inc., of this city, and Ernest Ingold, Inc., of San Francisco, were recently appointed distributors for the Holbrook refrigerator, according to an announcement by L. W. Ward, vice-president and general sales manager of Holbrook, Merrill & Stetson, Inc., Ltd., Los Angeles.

Pacific Wholesale, Inc., which will direct sales in southern California territory, is headed by Walter M. Fagan. It is also distributor for Sparton radios.

Northern California territory will be served by the San Francisco distributor, which also handles Atwater-Kent radios. Ernest Ingold is president of the company.

Mr. Ward, accompanied by Gordon Muir, Holbrook advertising manager, conducted meetings at the new distributors' headquarters to explain the Holbrook refrigeration line to dealers.

NORGE MAKES NEW TIME PAYMENT ARRANGEMENTS

Detroit—Due to the fact that many dealers do not wish to sell their installment paper directly to a finance company, the Norge Corp. has adopted a new plan to meet this situation.

It is contemplated that each distributor will enter into a contract with the financing company by which he will assume a limited contingent liability of five per cent of the volume of paper purchased from his dealers through him in any one yearly period.

Under this new arrangement the distributor will have complete control of the amount of credit extended to his dealers by the finance company.

W. H. TAYLOR PAYS VISITS TO LATIN-AMERICAN G. E. OUTLETS

Mexico City, Mex.—William H. Taylor, manager of the refrigeration department of the Mexican General Electric Co. here, is making a tour of General Electric's Latin-American branches to assist in various sales campaigns that the branches will launch.

Mr. Taylor is expected to return here in about two months.

and they urged people not to patronize these stores.

There was a daily police patrol which picked up these pickets and carried them off to jail where they were confined for three months. However, there were so many Indians that in spite of this a new picket was on the job every day.

The pickets were mostly of small stature and it was interesting to see a



Copeland in Butter Factory

huge police sergeant, who is always a European, pick them up by the scruff of the neck, since they wear practically no clothes, and toss them into the patrol wagon.

While in jail the pickets received a credit of four annas or eight cents a day each from the Indian congress, which amounts to about \$4.80 for the three months he was incarcerated.

The interference with business caused a falling off in employment in the large cities and large numbers of coolies who came in from the outlying territories were in many cases forced to return to their work at the mines or on tea and rubber plantations.

For this reason Gandhi had the support of the rajah land owners since the civil disobedience campaign was forcing labor to return to them.

The coolie class was for Gandhi because they believed he was going to bring about better living conditions for them, that he would bring them plenty to eat.

BOHN PIONEERED THE PORCELAIN REFRIGERATOR

This is but one of the many advances pioneered by the Bohn engineers during thirty-five years of quality manufacturing.

BOHN has built thousands of cabinets for manufacturers of refrigerating machines who desired the utmost in beautiful and scientific construction to best set forth their mechanism.

BOHN would be glad to figure with those organizations who recognize that a quality all-porcelain refrigerator is a distinct merchandising asset.

BOHN REFRIGERATOR COMPANY
SAINT PAUL, MINNESOTA

Write for details of low prices now prevailing on stock models.

Eight Cu. Ft. Model Added to Line

Cleveland—The electric refrigeration department of the General Electric Co. has announced a new domestic refrigerator model, the S-82, having 8 cu. ft. of food storage space and 13½ sq. ft. of shelf area. The cabinet is of all-steel construction, finished with a Sanak exterior and porcelain interior. The door openings and door edges are faced with black textolite strips secured with corrosion resistant screws.

Sliding shelves have been provided in this refrigerator to make all parts of the cabinet equally accessible. These shelves are finished with a newly developed multi-plating process which, officials claim, makes them very resistant to corrosion.

A Du-Flex rubber tray is included as a standard accessory. This rubber tray has stainless steel wires running along the bottom so that it is self-supporting when filled with water.

Two standard metal trays and one deep metal tray are also provided. These trays are equipped with covers and have new tapered metal dividers, making the removal of ice cubes easy. The four trays hold a total of 12 pounds of ice or 104 cubes.

JACKSON-STEPHENS ENTER REFRIGERATION FIELD

Dallas, Tex.—The Jackson-Stephens Co., 2114-16 Main St., is now wholesale distributor for Servel.

T. P. Stephens and A. A. Jackson, Jr., are the partner members of the company, which will distribute Servel equipment in the north part of Texas and much of the southwestern territory centering around Dallas.

This company was formerly engaged in the wholesale distribution of tires and automotive supplies.

In Glistening White Porcelain Enamel

Made in Three Popular Sizes



Fits All Types of Refrigerators

ADOPTED AS STANDARD EQUIPMENT BY MANUFACTURERS
PRICED ESPECIALLY LOW FOR DISTRIBUTORS. WRITE FOR SAMPLES AND PRICES
THE BELLAIRE ENAMEL CO., BELLAIRE, OHIO
Enameled Refrigerator Utensils Enameled Defrosting Pans

EXPORT SHIPMENTS OF REFRIGERATORS

December Shipments Reported by the Bureau of Foreign and Domestic Commerce

	Electric Household Refrigerators	Electric Commercial Refrigerators Up to 1 Ton
	No. Val.	No. Val.
Austria	1 101	
Belgium	37 5,075	3 532
Czechoslovakia	2 200	
Denmark	6 889	1 85
Finland	1 183	
France	103 11,877	46 5,965
Germany	33 3,387	11 1,825
Gibraltar	1 325	
Greece	9 974	
Iceland	1 104	
Irish Free State	7 573	
Italy	7 319	
Netherlands	22 2,330	11 2,034
Norway	1 140	
Poland and Danzig	1 189	
Rumania	4 500	1 825
Spain	23 3,182	4 562
Sweden	21 2,298	
Switzerland	13 1,775	11 2,022
United Kingdom	187 19,939	145 10,691
Canada	330 42,113	22 4,817
Costa Rica	3 722	
Guatemala	2 245	2 548
Panama	19 3,645	2 413
Salvador	2 294	
Mexico	46 9,772	7 2,136
Bermudas	18 3,174	5 2,101
Barbados	3 425	
Jamaica	20 3,420	4 1,324
Trinidad and Tobago	2 525	
Other British West Indies	8 1,723	
Cuba	77 12,550	16 3,552
Dominican Republic	5 987	4 1,901
Northern West Indies	13 1,900	
French West Indies	1 212	
Haiti, Republic of	34 5,632	
U. S. Virgin Islands	2 234	1 450
Argentina	237 41,909	40 20,485
Brazil	409 49,188	37 11,898
Chile	19 1,555	
Colombia	48 6,115	5 1,345
Ecuador	10 1,670	
French Guiana	5 798	
Paraguay	6 787	
Peru	7 789	6 744
Uruguay	297 24,101	39 5,743
Venezuela	78 10,343	9 2,155
British India	98 14,771	60 9,556
British Malaya	8 983	11 1,625
Ceylon	12 1,246	2 758
China	1 120	2 630
Java and Madura	5 327	1 165
Other Netherlands East Indies	9 1,004	
French Indo-China	1 200	
Hong Kong	7 763	
Japan	14 2,248	11 1,883
Philippine Islands	125 16,406	3 1,000
Turkey	1 112	4 1,048
Australia	55 6,038	14 1,320
New Zealand	24 3,899	
British East Africa	335 52,515	23 3,652
Union of South Africa	28 3,943	
Gold Coast	20 2,862	
Nigeria	5 670	
Other British West Africa	22 1,760	
Egypt	7 520	
Algeria and Tunisia	3 585	
Other French Africa	4 652	
Morocco	4 514	4 643
Mozambique	1 185	
Canary Islands	8 1,220	
Total	2,978 \$392,821	569 \$100,071
Shipments to Hawaii	143 \$19,429	17 \$2,842
Porto Rico	63 \$11,001	3 \$1,002

RETAILERS SOLD 63.7% OF WORKING MACHINES IN '29

Washington, D. C.—According to a preliminary report issued by the Bureau of the Census, U. S. Department of Commerce, the total 1929 sales distribution of the household laundry machine industry amounted to \$80,064,000, of which 63.7%, or \$51,046,000, was made to retailers, and 25.3%, or \$20,269,000, to wholesalers.

Remaining sales were made as follows: 6.2%, or \$4,950,000, to industrial and other large consumers; 4.2%, or \$3,349,000, through manufacturers' sales branches; and 6%, or \$4,550,000, to home consumers.

Of the foregoing total sales, 4.3% or \$3,421,000, was made through manufacturers' agents, brokers, commission houses and selling agents.

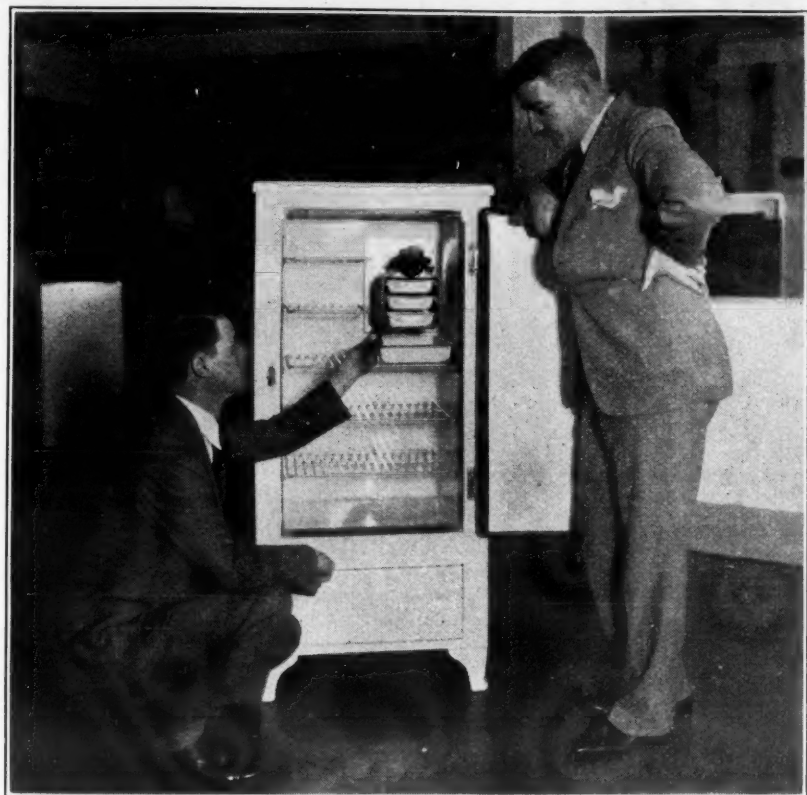
These figures also include the distribution of \$4,344,784 worth of secondary products made by the 63 manufacturing establishments of household laundry machines.

Household laundry machines made as secondary products of establishments in other lines of manufacture are not included.

COPELAND APPOINTS JACKSON COMPANY

Jackson, Miss.—The Peoples Furniture Co., East Amite and North Parish Sts., was recently appointed distributor for Copeland refrigerators.

Harper-Meggee Takes Servel Franchise



Northwest distribution for Servel domestic and commercial lines have been taken over by Harper-Meggee, Inc., Seattle, Wash., former distributors for Copeland in this territory during the last five years.

Branch offices are maintained in Portland and Spokane. In addition to refrigerators, the company handles RCA radios.

In the photograph looking over the new Servel are (left) R. F. Meggee, president, and J. C. Williams, retail sales manager.

Answers to Questionnaire Show 20.6% Saturation

Washington, D. C.—Of 1,242 persons who responded to a United States Department of Commerce questionnaire, 256, or 20.6%, owned electric refrigerators. The question asked was: "Do you have a mechanical refrigerator?" The names of those to whom the questionnaires were sent were selected at random. Five of the cities from which replies were received were well below the general average of 20.6% (running as low as 4.6% in Des Moines, Iowa), while four cities were well above (running as high as 62.5% in Oklahoma City, Okla.).

A table of the replies to the questionnaire follows:

City Visited	Yes		No	
	Number Replying	Per Cent	Number Replying	Per Cent
Washington, D. C.	8	7.6	97	92.4
Baltimore, Md.	42	39.3	65	60.7
Denver, Colo.	9	9.9	82	90.1
Oklahoma City, Okla.	25	62.5	15	37.5
Kansas City, Mo.	14	15.4	78	84.6
Des Moines, Iowa	3	4.6	62	95.4
St. Paul, Minn.	16	13.6	102	86.4
St. Louis, Mo.	12	13.4	79	86.6
Chicago, Ill.	30	35.1	55	64.9
Buffalo, N. Y.	61	61.0	39	39.0
Columbus, Ohio	4	5.1	74	94.9
Chattanooga, Tenn.	16	17.6	75	82.4
Birmingham, Ala.	5	5.7	82	94.3
Atlanta, Ga.	11	12.0	81	88.0
Total	256	20.6	986	79.4

ELLIOTT-LEWIS CO. BECOMES DISTRIBUTOR FOR COPELAND

Philadelphia—The Elliott-Lewis Electrical Co. is now distributor for Copeland electric refrigerators in southern New Jersey, eastern Pennsylvania and all of Delaware.

It has set up a complete organization,

a dealer-help department, and installation crew, and a 24-hour upkeep service for Copeland purchasers. The firm has a personnel of more than 70.

Frank R. Elliott is president; T. Harry Lewis, vice-president and treasurer; C. A. Dougherty, secretary and general manager; and Frank Brown, employed by the company for more than 22 years, store manager.

TODAY'S RESULTS TO YOU MUST BE PROFITABLE

At no time in the past twenty years of history of Electrical Refrigeration Merchandising have such liberal and attractive policies been available until the advent of

KULAIR

which created entirely new standards of Distribution, Quality, Price and Capacity in the Sulphur Dioxide and Methyl Chloride field, with all sizes of Compressors and Condensing Units. Important enhancement of enthusiasm and establishment of retail customer confidence in KULAIR clientele selling over private brand names will apply to your establishment with an efficient and cumulative profit result.

IT IS FOR YOU TO PUT THIS PLAN TO WORK TODAY

Write to

KULAIR CORPORATION PHILADELPHIA, PA.

Decline Shown In Homes Using Ice

Milwaukee—A survey conducted by the Milwaukee Journal here shows that a considerable increase in the number of families using natural ice has developed, but the percentage of all families using ice in this form has grown smaller within the past several years.

According to the analysis, 119,219 families, or 71.9 per cent of all families in Greater Milwaukee, were using ice as of Jan. 15, 1931. During the year ending Jan. 15, 1927, a total of 104,379 families, or 73.5 per cent of all families, were using ice.

For the year ending Jan. 15, 1926, according to the analysis, there were 108,464 families using ice, or 77.0 per cent of all families were using natural ice.

FARM POPULATION GAIN REPORTED FOR LAST YEAR

Washington—According to the Bureau of Agricultural Economics, the first gain in farm population which has taken place in the last decade occurred in 1930.

On January 1, 1931, the total farm population was 27,430,000. The total was 27,222,000 at the beginning of 1930.

The Bureau further estimates that the movement from the farm to the cities accounted for a loss of 1,543,000 persons in 1930, compared to 1,876,000 in 1929, and 2,155,000 in 1926, the peak of the "away from the farm" movement.

These figures are somewhat offset by people moving to the farm from the cities. In 1930 the net loss to the farms was 151,000 persons.

Due to the preponderance of births over deaths, 359,000 persons were added to the farm population, leaving a net gain of over 200,000 persons for the year of 1930.

APPLIANCE SALES INCREASE NIAGARA HUDSON LOAD

Buffalo—Niagara Hudson Power System's electrical appliance sales in 1930 will add an estimated 15,575,000 kilowatt hours to the system's power lines, in which increase the sale of 6,021 electric refrigerators played no small part.

A concentrated two-month mid-winter drive is believed to have established a new record here for winter refrigeration sales, 933 domestic units being sold.

TEXAS CITY USES 2600 REFRIGERATORS

By Carolyn D. Timmons

Amarillo, Tex.—Approximately 2600 electric refrigeration units are in operation in this city. This is the estimate of local dealers, who report increased sales for the last year.

W. L. Finklea, who operates an electrical supply store at 511 Polk St., has been handling the General Electric refrigerator for three years. His last year's refrigerator sales totaled 210 machines, a gain of 50 per cent over the previous year.

Mr. Finklea's appliance business in 1930, including electric refrigerators, ran to \$120,000. In 1928, when he added refrigeration he placed 70 refrigerators in Amarillo homes. Sales of refrigerators jumped 100 per cent in 1929 as that year 140 machines were sold by Mr. Finklea.

Frigidaire is merchandised by the Southwestern Public Service Co., 518 Taylor St., who report sales of 447 units for 1930.

Early in 1930 E. E. Finklea, 808 Polk St., took over the Kelvinator franchise for this territory. His first year's refrigeration business in both the domestic and commercial fields hit a total of about \$42,550.

Sixty-five domestic Kelvinators, valued at \$17,750, were sold to residents in this area. Commercial sales, according to Mr. Finklea, were very good, as 35 heavy duty condensing units approximating \$24,800 were sold to grocers, butchers, etc.

Two interesting ice house installations were made by Mr. Finklea, in which the job of keeping the ice from melting is handled by Kelvinator equipment.

Small towns scattered about the plains near Amarillo have ice houses in which the dealers store ice that has been delivered from the city. In two of these ice houses, Kelvinator equipment was installed to maintain an even temperature.

Majestic entered the Amarillo field near the close of 1930. Two dealers, the Amarillo Electric Co., 111 E. 8th St., and Charles Lowe, 1307 Polk St., are preparing for an active year selling Majestic refrigerators. J. C. Arnold is manager of the Amarillo Electric Co.

"EBCO" "THE STANDARD OF QUALITY"

"EBCO" AUTOMATIC SELF-CLOSING STREAM CONTROL VALVES

Squirting and waste of water are entirely eliminated—Complete control—automatically—of the stream height is assured under all fluctuating pressures between 20 and 120 pounds. Applicable to all types of drinking fountains.

Saves Water

Eliminates Squirting

REGULATOR

for installation in water supply lines to prevent fountains 3-8 in. I. P. Inlet and Outlet.

EXPOSED TYPE

Chrome plated union inlet—3-8 in. I. P. Outlet.
C-1300 2-prong handle.
C-1300 H 4-prong handle.
C-1300 L Lever handle.



EBCO Water Coolers

CAFETERIA AND RESTAURANT TYPE

Model C-319 (Patents Pending)

With cold water storage compartment. Cabinet to house compressor. Black Vitreous enameled Top and White Vitreous enameled Receptor. Two No. 7 Chrome-plated Glass Fillers.

DIMENSIONS

Width, 38"; Depth, 25"; Height, 48". Compressor Space, 35" x 25" x 23" high. Capacity: 50 gallons in 2 hours with 1/2 H. P. Compressor.

THE D. A. EBINGER SANITARY MFG. CO. COLUMBUS, OHIO

Manufacturers also of Ventilated Closets, Urinals, Round Wash Sinks, and Steel Compartments for Toilet Rooms.

THE EXPANSION VALVE

Stories of Interesting PEOPLE in the Refrigeration Industry

By GEORGE F. TAUBENECK

Following an illustrious predecessor in the General Motors line—the Cadillac automobile—Frigidaire has adopted a crest.

This coat-of-arms is being featured in 1931 Frigidaire advertising, and has—being an innovation in this industry of pioneers and trail-blazers—provoked many nonplussed expressions.

For those who haven't been let in on the mysteries of this crest, the following explanation of its symbols may prevent a lot of furrowed brows and save a few private secretaries from research assignments into the language and meaning of heraldry.

Crowning the crest is a crown, which is a mark of sovereignty and honor. In the upper right hand corner of the escutcheon are four white stars upon a blue background. The white stars symbolize health; the blue background denotes sincerity. In the lower left corner are 12 white dots, which signify snow—the emblem of purity.

Running vertically down the center of the shield is a narrow strip (called a "pale") which is embellished with four cedar trees. The cedar trees represent long life.

Horizontally the escutcheon is divided by a yellow strip (a "tesse") bearing the word "FRIGIDAIRE" in deep green letters. Youth and ambition are said to be denoted by the green, while the yellow indicates loyalty.

In the upper left corner is the capital letter "G" done in antique gold on a tawny orange background. A capital "M" is blocked out in similar fashion in the lower right corner. Gold signifies loyalty; orange represents strength and loyalty. And there you have it.

Cooper Blue

R. Cooper, Jr., polished G. E. distributor in Chicago, staged quite a show last Thursday, following his "Monitor Top" convention Wednesday.

To Mr. General Public's gaze he opened his mammoth new display room, reputed to be the biggest and most costly in refrigerationdom, and an impressive suite of offices—22 stories above the display.

Cooper should well be able to afford an array of this nature. He did 58 per cent more business in 1930 than in 1929, and the first two months of 1931 showed

N.E.M.A. SPRING MEETING TO BE HELD IN VIRGINIA

New York City—The spring meeting of the National Electrical Manufacturers Association will be held at "The Homestead," Hot Springs, Va., May 18-23.

In the refrigeration division the following committee appointments have been made:

Advisory Committee—Louis Ruthenburg (Copeland Products, Inc.), chairman; G. M. Johnston (Universal Cooler Corp.), and Geo. W. Mason (Kelvinator Corp.).

Commercial Practices Committee—F. E. Smith (Servel, Inc.), chairman; H. W. Burritt (Kelvinator Corp.), J. A. Harlan (Frigidaire Corp.), G. S. Smith (Copeland Products, Inc.), C. D. Taylor (Westinghouse Elec. & Mfg. Co.), P. B. Zimmerman (General Electric Co.).

Codes and Ordinances Committee—M. C. Terry (Westinghouse Elec. & Mfg. Co.), chairman; O. A. Brandel (Norge Corp.), J. J. Donovan (General Electric Co.), R. E. Smithson (Frigidaire Corp.), C. C. Spreen (Kelvinator Corp.).

Technical Committee—H. M. Williams (Frigidaire Corp.), chairman; H. C. Hayes (Norge Corp.), Edward Heltman (Kelvinator Corp.), Glenn Muffy (Copeland Products, Inc.), A. R. Stevenson (General Electric Co.), H. E. Thompson (Universal Cooler Corp.), E. T. Williams (Servel, Inc.).

REALISTIC DISPLAYS SEVERS TIE-UP TO REALISTIC SALES

Newark, N. J.—Realistic Displays, Inc., announces the termination of its agreement with the Realistic Sales Builders of New York City.

Shipments to Australia, China, and South America have been in the increase recently, officials of the company state.

a 50 per cent increase over the corresponding period of 1930.

The display room, which occupies the northwest corner of the new La Salle-Wacker building (described in "An Editor on Wheels" in the March 11 *Refrigerated Food Section*), presents four features to the eye: G. E. refrigerators, many square columns, a great quantity of glass, and modernistic furnishings.

Elsewhere in this issue is published a picture of the display room. The picture doesn't at all portray the size of the room, and for a good reason.

Those many columns, mentioned above, prevent even a camera-eye from taking in the whole sweep of the place with one look. No matter what position one takes, the view is hemmed in and cut off by the columns.

Embellished with Monel metal strips, these pillars have alternate glass and blue enamel faces. A diligent investigation failed to reveal a single decorator or color expert who knew exactly what variety of blue was used on the columns.

So this new color, which might be a cross between sky-blue and royal purple—were it not for the fact that it doesn't look a great deal like either one—will be known as "Cooper blue."

Metal furniture, striking linoleum, and a general breaking up of a great deal of floor space into many small offices, feature the Cooper headquarters on the 23rd floor of the La Salle-Wacker building.

Deft touches of a good interior decorator make the layout rise high above the commonplace in office design.

Adjoining Mr. Cooper's private office is a still more private room. It is designed like the prow of a ship, with a helm, portholes, cabin furniture, an outlook upon water (Chicago River), and everything but the natural roll of a ship. It lends a rare atmosphere to "in conference" sessions.

Mike Mahoney

At the sales convention held last week in St. Louis by James & Co., G. E. distributor in the "49th state," M. F. Mahoney, General Electric refrigeration department sales manager, did himself proud.

Climaxing a banquet, other good speeches, an entertainer who put S. A. into accordion music, and an hour of unfettered hilarity, Mahoney delivered an oration on the possibilities of electric refrigeration which converted laughter and frivolity into rapt attention and sober countenances.

Watching Mahoney before he rose to talk, one expected a few short sentences and a meek presentation. (He looks like a listener, rather than a speaker.)

But when he rose to his full height and began to speak that night, one

knew that an expert in mass psychoponding period in 1930.

In perfect command of the situation at every stage of the long period he held the floor, he sensed exactly the right moments to offer relief in the form of an anecdote, to change the pitch of his emotional intensity, and to crack an important idea on the nose.

Best of all, he knew when he had reached the peak of his speech, and ceased firing accordingly.

Accompanying Mahoney on his barnstorming tour of distributors' conventions are three musketeers of good-fellowship: H. C. Mealey, A. A. Uhalt, and Paul Dow. All three know how to win friends. And they put their talents to valuable use.

James & Co.

An increase of 70 per cent in 1930 over business done in 1929 was announced by James & Co., the St. Louis G. E. distributor, at the above-mentioned convention.

Observing James in action among his dealers and salesmen, one can begin to understand how a record like that can be made in a depression year.

His every gesture bespeaks trustworthiness; sincerity shines from his words. He is the type of leader for whom men will go out and work until they drop—just to please him.

Harvey B. Lindsay

To men of science, Harvey B. Lindsay is known as the author of the "Lindsay Theory" of Specific Surface Resistances. To industrial and business circles he is known as the president of the Dry-Zero Corp.

Still others know that Lindsay is more than a scientist, more than an astute business man. He is a philosopher.

He knows so much about molecules and atoms that Dr. Irving Langmuir, perhaps the most famous of the Schenectady wizards, once pushed a busy day's appointment calendar into a wastebasket just to listen to Lindsay talk.

Yet he maintains that the more he learns, the more he realizes that he knows comparatively nothing. His feeling is somewhat akin to that of Sir Isaac Newton, who once said:

"I feel like a child playing along the seashore, occasionally picking up a pretty pebble, while the great ocean of Truth lies undiscovered before me."

"Whenever I run across a man who thinks he knows a great deal about physics, I simply ask him to explain to me the nature and meaning of 'pull,'" says Mr. Lindsay.

"Nobody I have yet met can satisfactorily elucidate so simple a phenomenon as 'pull.' And yet we think our scientific learning is in a highly advanced stage."

Lindsay has not only the manner and the approach of a philosopher, but the

physical characteristics as well.

Spare, trim, expansive of forehead, with eyes which are both objectively penetrating and abstractly ruminative, he has every appearance of a seer. And he smokes a pipe!

Dealers & Dollars

The King Plumbing Co. of Keokuk, Ia., formerly sold oil burners. Today this concern merchandises Frigidaires exclusively.

One idea gained from handling oil burners, however, the King company has profitably carried over into the electric refrigeration business. It is that of handing service on a yearly flat rate basis.

For a specified sum, the King service man will come when called. In addition, he will make a periodic check upon the machine every three months.

Fort Madison, Iowa, has a problem. Its 25-cycle electric current is the problem, and a serious one it is, too, for 25-cycle electrical appliances are odd numbers with most manufacturing concerns.

Manager Lawrence of the Industrial Plumbing & Heating Co., for instance, can't get a Capitol model of the Williams Ice-O-Matic refrigerator. He has on display a 7 cu. ft. Ice-O-Matic equipped with an older model of the Williams refrigerating unit, however.

Similarly handicapped are R. M. Parks, sales manager of the Fort Madison Electric Co., G. E. dealer, and E. Nabers, crack Majestic salesman and dealer.

Art Weinhardt

Art Weinhardt, Fort Madison Frigidaire dealer, was one of the young army of engineers who encamped at Keokuk between 1910 and 1913 during the building of the dam.

Those engineers married practically the entire supply of eligible girls in Keokuk and surrounding towns during their stay, and Art walked to the altar with a blushing bride from Fort Madison.

He liked the scene of his courtship so well that he stayed, and there he is today.

Weinhardt's star order-getter is a woman. From a brother-in-law who sold Frigidaires, Mrs. Youel caught a keen enthusiasm, and so she went down to see if Weinhardt could use her in his sales department. He could, and did. Her first order was for a \$600 MC12 Frigidaire!

Mrs. Youel finds that morning is the best time to sell electric refrigerators to housewives.

And since her small son is in school during the morning, she also finds it the most convenient time for her to go abroad armed with dotted lines and sales points.

Strange Bedfellows

On adjoining billboards in Fort Madison are two large posters. One reads: "Kelvinator for every home." The other asserts something to the effect that no other method of refrigeration is so efficient and economical as ice. Both posters are signed by the Artesian Ice Co. of that city.

Last year officials of the Artesian

Ice Co., which enjoys a monopoly on the Fort Madison ice business, decided to follow the trend of the times, and took the Kelvinator franchise. That the move was wise has been proved by the almost immediate profits realized from the new line.

Artesian ice is being aggressively pushed at the same time, and so are ice refrigerators. Believe it or not.

One of the first things the Artesian Company did after acquiring the Kelvinator dealership was to place heavy-duty commercial units in each of its nine substations.

These installations paid for themselves in short order by preventing ice wastage. Formerly the substations had rarely shown a profit.

With the new compressors on the job, less ice now melts in a week than formerly melted in a day, and the company is making money on its deliveries to outlying districts.

Servicing the refrigerators they sell has been relatively easy, Artesian officials maintain. They have men in their employ who have been taking care of refrigerating machines for many years, and who have quickly adapted their knowledge to the smaller units.

Commercial estimating also seems simple to these men. They have accurate records kept over a long period of years, of the amounts of ice used daily, weekly, and monthly by all the commercial prospects in town.

Given these figures they experience little difficulty in determining the refrigeration needs of the grocer or butcher, and in supplying him with the proper equipment.

Avoirdupois

T. W. R. Mesheu, who sells Kelvinators for the Public Service & Gas Co. of Passaic, N. J., weighs 350 pounds. He wears an 18½ collar, 11½ shoes, has a 56-inch chest, and a 52-inch waist.

Recently he won a derby hat in the nation-wide Kelvinator "Glad Rags" contest. But lo! The Stetson factory did not keep in stock a derby large enough for Mesheu.

One of proper beam and displacement was finally fashioned, but not until two letters were written by incredulous Stetson officials to verify the measurements.

SAMPSON ORGANIZATION VISITS WILLIAMS PLANT

Bloomington, Ill.—A delegation of more than 200 members of the Sampson Electric Co., Williams Ice-O-Matic distributor in Chicago, visited the factory here Thursday, March 10.

Arriving about noon in three buses and a train of motor cars, the visitors, after a luncheon period, immediately got down to business. The entire day was spent in sessions with various officials of the Williams organization.

"Factory production is in high gear, and we have found it necessary to employ a night shift to take care of our stepped-up Ice-O-Matic production," C. U. Williams, president of the company, told the visitors.

During the course of the day the Sampson delegation heard W. J. Breitt, sales manager of the Williams organization; D. M. Frank, advertising manager; and Beverly Miles of the Ice-O-Matic sales division. R. D. Marshall presided at all of the sessions as chairman.

When it was realized that it would be impossible to finish the desired business before dinner, a meal was prepared and the session continued on far into the night. At the evening meeting the delegation heard J. A. Worsham of the Williams sales staff give a humorous address.

Routine of the meeting was broken at various intervals with spirited singing under the leadership of Lyle Straight, V. D. Greenhouse, assistant manager, and George Wertzler, wholesale manager, of the Sampson Electric Co. were in charge of the delegation.

The factory will be visited frequently within the next few months by delegations of distributing organizations. President Williams announces.

MILLER, RUBBLE TAKE NEW POSITIONS

Tulsa, Okla.—The Spurrier Lumber Co., state Servel distributor, has named Claude Miller as manager of the newly organized radio and domestic refrigeration department. W. J. Rubble is now manager of the commercial and apartment house refrigeration division.

Chicago Ice-O-Matic Organization at Bloomington



Delegation from Sampson Electric Co., which recently inspected the Williams factory.

STAR FRIGIDAIRE SALESMEN REGISTER HAPPINESS



A. E. Roach



Max Schwimmer (left) and H. O. Wilson



Star Frigidaire salesmen on their way to inspect production lines in the big Morraine plant.



F. C. Fuller (left) and F. A. Correa



W. L. Murphy



F. C. Fuller



H. O. Wilson



G. K. Wadsworth



Harry Ertz



F. A. Correa



E. A. Lockwood



R. B. Brown



Quartet of Trip to Dayton Winners. (Left to right) Carl Clifton, E. W. Russell, A. E. Roach and L. E. Kreps.



A. E. Israel



L. E. Kreps

Notes on Frigidaire Convention

C. R. Foy, of the Penn Traffic Co., Johnstown, Pa., who sells both household and commercial lines, estimates that about 65 per cent of the restaurants, grocers and meat markets in his territory now use electric refrigeration.

T. G. Schlegel ranks as the number one veteran of the New York Frigidaire sales organization, having more years of service to his credit than any other salesman.

D. Meister, of the New York district, recently signed a \$71,000 hospital equipment order.

According to Harry Ertz of the National Refrigeration Co., Frigidaire distributor in Buffalo, N. Y., it is not hard to sell electric refrigerators to Greeks who operate restaurants and candy kitchens. They make good money and pay their bills.

T. Knudsen, commercial manager for W. C. Dance, dealer of Tulsa, Okla., recently sold to the Indian Hills Country Club of Tulsa the following Frigidaire equipment: One 45 cu. ft. box, one 60 cu. ft. box, each with two 60 TF coils; one 12 cu. ft. box with one 60 TF coil; one 4-hole ice cream cabinet; one No. 8 storage cabinet for beverage cooling, and one model 40D water cooler.

A. D. Armstrong, of Toronto, holds the reputation of once having closed six individual orders between the hours of one and seven P. M.—a sale every hour.

G. Watson, of New York, has ranked either first or second in sales every year for the past four years.

A. Israel, of New York, sold 189 Frigidaires in 140 days. He has an idea that he would like to sell electric refrig-

erators in some foreign country, Japan, for instance.

R. A. Somerville was the first man to qualify for the trip to Dayton, having made his 150 per cent of quota before the year was half over.

A. M. Gathright, of Norfolk, Va., holds the enviable reputation in Frigidaire circles of having the best operated dealership in the United States.

J. P. Sensibaugh and J. E. Walker, of the Norfolk district, were formerly railroad engineers.

J. P. Neifing, of the Pacific Coast region, sold \$25,000 worth of electric refrigeration equipment to Stanford University.

L. A. McLean, of the Queensboro Gas and Electric Co., Far Rockaway, N. Y., says: "All I want is advertising—continuous advertising. Keep the price up."

He recently sold five units to the St. Joseph Hospital, consisting of Frigidaires equipped with the new F-12 gas. Last year he sold 212 household units.

R. D. Funkhouser, senior vice-president of the Frigidaire Corp., says: "It is not the size of the dog in a fight, but the size of the fight in the dog."

E. N. Madden, who talked on export business, pinch hitting for Mr. Shannon, states that 70 per cent of all electric refrigerators exported in 1930 were Frigidaires. "Frigidaire is now represented in every civilized country in the world," he says, "and some not so civilized."

Lieutenant-Governor William Pickrel, of the state of Ohio, took exception to the introduction given him by Chairman H. C. Jamerson at the B. T. U. Club banquet.

"When I'm introduced at a banquet like this," he said, "I expect the toastmaster to lie a little. I crave adjectives."

T. Knudsen, of Tulsa, Okla., tells about his experience with a Greek prospect who knew exactly what kind of an electric refrigerator he wanted to buy. "I want a General Motors Frigidaire," said the Greek; "the kind that has that round thing on the top."

Oscar Housen, of Reno, Nevada, known to his city friends as "the Desert Rat," has a territory consisting of 110,000 square miles. He has been a member of the B. T. U. Club for five years, and this was his second free trip to Dayton. Recently he sold 24 units, household and commercial sizes, to the Hawthorne Naval Ammunition Depot at

Hawthorne, Nev. He also sold a Frigidaire to Gov. Fred Balzar, of Nevada.

Jack Neifing of Palo Alto, Louis Krepp of Burlingame, and F. H. Fackler of Haywood are team workers. Each is an independent Frigidaire dealer; but the three have sales meetings together and co-operate in buying.

All three operate under Supervisor R. D. Thomson. The three have made the B. T. U. Club and won a second trip to the factory at Dayton.

"Spike" Weltzin, San Francisco apartment house supervisor, has secured a big order for an apartment development known as "The City by the Golden Gate." (At this juncture the reporter was offered a drink and failed to get further details.)

Biechler Welcomes B. T. U. Club

Dayton.—E. G. Biechler, president and general manager of the Frigidaire Corp., officially welcomed the "Trip-to-Dayton" division of the B. T. U. Club in a special edition of the corporation's house organ, *Frigid Era*. The visitors found the edition in their mail boxes as soon as they registered at their Dayton hotel Monday morning.

"Your presence in Dayton at this time," read Mr. Biechler's message, "identifies you as outstanding leaders in our sales organization. You have merited the respect of your fellow-salesmen. They have observed your accomplishments, have striven to emulate them. The fine business you have produced has helped to keep workmen employed. Thus you have earned the admiration and esteem of the manufacturing division."

"On behalf of the entire factory or-

ganization I take this opportunity of welcoming you and congratulating you upon your excellent performance. There is no need for me to say that we are proud of you. Instead, I want you to know that we have faith in you. We expect you back next year. And with you we expect many of your admirers, others of our salesmen who today are applying your well-founded principle of success—hard work.

"This year should be a good year for us. Every indication is for increased Frigidaire business. Our new white porcelain-on-steel household models are a smashing success. The three-year guarantee on both cabinet and compressor has met instant approval. Our advanced refrigeration advertising rapidly is increasing the preference for Frigidaire. And out there in the field there is a great back-log of orders—people who put off buying last year.

"We have taken the occasion of your visit here to celebrate Frigidaire's ten years of progress in Dayton. This progress, which we feel has been great, was made possible by men such as you. Repeatedly we have set the goal high. Repeatedly we have reached it and gone beyond. Not only in sales, but in every line of progressive endeavor. While you are here we want you to have a good time and get a better picture of the business in which you have such a vital interest. The comparison in another ten years will be interesting. Although we have made great progress, we are only on the threshold, we have merely scratched the surface of the great market which awaits you. Lastly—when you return to your homes, we want you to tell your associates what you have seen in Dayton, and pass on to them the assurance that the factory will do its level best to measure up to the high standards the sales organization is going to set this year."



E. G. BIECHLER
Frigidaire President, who saluted the Trip-to-Dayton Winners.

DOUGLAS EXPLAINS SALES ARGUMENTS

By R. G. Douglas
Liquid Cooler Corp.

SALES of water cooling multiple systems can be made with sales arguments closely resembling those which have been effective in the growth and acceptance of the domestic multiple installations, judging from the increasing water cooling multiple systems.

Sales of multiple installations in the apartment house field were built up around the talking points of economy of first cost and in operation cost, ease of servicing and maintenance, and convenience to owner and tenant. The distributor who is set up to make multiple installations of water cooling equipment uses the same arguments.

The salesman who is successful in selling multiple installations to apartment house owners, can turn many of his sales arguments to the sale of multiple water cooling systems. In addition, he has other sales points which he can use, that have come as the result of new developments by different manufacturers in the water cooler industry. These new features include such points as instantaneous cooling, cooling at the point of usage, definite temperature control, a greater variety of models with a consequent greater range of capacities—all being points which water cooler manufacturers have brought to a high degree of perfection, and in many cases actual accomplishments in the past six months or year.

Two Water Cooler Markets

However, there is one big point of difference in selling multiple refrigeration equipment in the domestic field and in selling multiple water cooler systems. This difference is in the size or extent of the market. Multiple installation in the domestic field is confined to apartment houses almost exclusively, with an occasional installation being made in a private dwelling.

In the multiple water cooler field, there are two distinct markets, the first can be called the commercial market, which includes office buildings, stores, public buildings and apartment houses. The second is called the industrial market and comprises all types of plants, factories, shops, mills, etc.

Any one of the above classes of buildings to which multiple water cooler installations are suited is a market.

The past year has seen a considerable number of buildings, both commercial and industrial, having multiple water cooling systems installed in them. One manufacturer reports the sale of his multiple water cooler systems to total nearly two-thirds of his total volume of sales. This particular manufacturer offers equipment that enables distributors to handle buildings in which complete new equipment is required, including drinking fixtures and buildings that require only the refrigeration equipment, with fixtures already installed.

Today few plans for new buildings are drawn up that do not include a multiple water cooling installation in the specifications. Building reports for 1931 indicate an uptrend in volume of new structures and remodeling.

NEW YORK PLACES \$2.50 WATER TAX ON GAS UNITS

New York City—A special tax of about \$2.50 a year on automatic household refrigerators operated by gas has been announced by the Department of Water Supply, Gas and Electricity.

Two hundred and fifty pounds of ice a year is the estimated capacity on which this tax is based.

Special bills for refrigerators are received by home owners who pay for their water on a frontage basis. If the water is metered in the homes, the additional water used is included in the meter charge.

Electric refrigerators, with the exception of water-cooled machines, are exempted from this tax.

The tax is made under a city ordinance adopted on April 4, 1918. According to this ordinance, it provides that any machine or apparatus used in the production of ice or refrigeration should pay a yearly charge of \$20 per ton for the actual capacity of the machine, regardless of whether or not that amount was used.

CLARK COMPANY OPENS MAJESTIC SHOP

Syracuse, N. Y.—Clark Music Co. has announced the opening of the Clark Majestic Shop, next to its large music store at 420 South Salina Street.

Clark Music Co. has been identified with the musical growth of Syracuse for nearly three-quarters of a century.

W. T. Crane has been appointed manager of the Refrigeration Department.

Baltimore Salesmen Win Honors in Contest



Director Walke and his division were leaders in the Kelvinator "Glad Rags Contest"

Detroit—Salesmen of the Consolidated Gas, Electric Light & Power Co., Baltimore, under the direction of W. C. Walke, led all divisions in the "Glad Rags" contest recently conducted over the country by the Kelvinator Sales Corp. of this city.

The Baltimoreans who led the country in the contest are pictured here: (Seated)—E. J. McCall, supervisor; W. P. Ford; B. C. Phelps; A. A. Gibson; A. W. Hayes; W. C. Walke, director of Kelvinator department; Thomas McCorquindale; J. R. Keppler; H. H. En-

sor; H. J. Dunne and C. C. Brown, supervisor.

(Standing)—H. M. Myers; C. C. Dillingham; P. C. Dowd; E. B. Catling; G. E. Gray; John Cronhardt; H. L. Cook, supervisor; J. H. Canby; R. F. Allen; and W. H. Shasman.

REX COLE REPORTS LARGE INCREASE IN BUSINESS

New York City—Marked business increases, with January and February 50 per cent ahead of 1930, and March sales running 70 per cent ahead of the corresponding month of last year, were announced by Rex Cole, distributor of General Electric refrigerators, at a spring sales convention in the ballroom of the Hotel Plaza, here, last Friday.

Predicting a \$15,000,000 business for the metropolitan territory in 1931, and citing the early sales volume of refrigerators of this year as "one of the best barometers in industry," Cole told more than 1,000 employees that "happy days, indeed, are here again."

A 50 per cent increase in the 1930 quota of General Electric refrigerators for 1931 probably will have to be increased, according to present indications, Cole told the delegates, pointing out that the very fact that electric refrigeration is no longer considered a luxury is one of the best arguments that "prosperity today is a fact."

"In 1927 the majority of our buyers were homes with incomes of \$10,000 and up. Now, the bulk of the market is composed of families earning \$50 a week and more," Cole states.

E. H. Campbell, advertising and sales promotion manager, outlined plans for greatly increased expenditures for newspaper advertising, radio broadcasting and direct mail.

He also described expansion steps of the organization, which now has 13 branch offices in the Greater City, Westchester, Rockland, Orange, Putnam, Nassau and Suffolk Counties, New York, and Fairfield County, Conn., and more than 100 other sales outlets in the general territory.

"Recently," Campbell said, "we annexed 149,562 square feet of space in lease deals, involving aggregate rentals of \$1,189,000."

"Increased sales volume and great public response made this step imperative," he declared, claiming the transaction constituted a record for a local distributor of a nationally advertised product.

BUFFALO CONCERN HOLDS PROSPECT MEETINGS

Buffalo—Every other Friday evening Ereo, Inc., distributor of General Electric refrigerators, is "at home" to a group of users and prospective users of General Electric refrigerators.

At these gatherings the film, "Trials of Refrigeration," is shown; a home service woman gives an hour's talk on recipes and frozen desserts and refrigerated refreshments are served.

WESTINGHOUSE APPOINTS MILWAUKEE COMPANY

Milwaukee, Wis.—The Wisconsin Sales & Supply Co. has been appointed distributor of Westinghouse electric refrigerators for this area.

The company, which was organized in 1926, is headed by Raleigh W. Barbour as president, and John W. Duncan is treasurer.

Detroit Co. Forms New Water Cooler Dept.

By H. R. Bilbrey
Commercial Sales Director,
Caswell-Stull, Inc., Detroit

BECAUSE of the fact that the saturation point for water coolers is

A force of 20 to 25 men will devote practically negligible, a special department is being formed by Caswell-Stull, Inc., to concentrate on their sales, all its time to selling water coolers in a campaign with which the General Electric Cleveland office will co-operate by sending out direct-mail appeals.

Lists of prospects are first made up from all available sources, such as paper cup companies, etc. These prospects are prepared for the first visit of the salesman by two pieces of direct-mail literature from the Cleveland office which stress the health, convenience, and service appeals of water coolers, and attempt to show why a person is more efficient when he has six to eight glasses of water each day.

Then the first visit of the salesman are made to the prospects who have received the advertisements. Each salesman will be given 15 to 20 names daily of prepared prospects. His visit is later supplemented by more direct-mail advertisements.

In these days when so little new building is going on, most prospects are proprietors of individual offices. These people are shown by the salesman how water coolers will increase the efficiency of their offices, with particular attention to proper placement of the coolers in their offices.

TIMKEN-DETROIT TO OPEN NINE NEW BRANCHES

Detroit—The Timken-Detroit Co. will open nine new factory branches during the month of April in the following cities: Staten Island, N. Y., Jamaica, N. Y., Hackensack, N. J., Oak Park, Ill., Stamford, Conn., Evanston, Ill., Brooklyn, N. Y., Bridgeport, Conn., and Birmingham, Mich.

Ralph Hooke and E. C. Ait were added to the personnel of the wholesale division. Mr. Hooke, who was formerly with the Petro-Nokol organization, will handle special assignments, working with dealers in building and training their retailing organizations.

Mr. Ait, previously connected with the 1900 Washington Machine Co. and the Holland Furnace Co., will cover the Indiana and Kentucky territories.

New dealers who will handle the Timken line are: Robert B. Payne, Inc., Fredericksburg, Va.; A. B. Heating & Sheet Metal Co., Racine, Wis.; Edward J. Sullivan, Kenosha, Wis., and Lewis G. Elsele, Iron Mountain, Mich.

BIRMINGHAM BRANCH OPENED BY BRAID CO.

Birmingham, Ala.—The Braid Electric Co., of Nashville, Tenn., has opened a branch here at 1525 First Ave., North. The Braid Co. is distributor for the entire mid-south, according to Erle Hyde, district manager.

DALLAS, PORTLAND MEN ORGANIZE FOR CAMPAIGN

Dallas—Plans for organizing the Texas division of the Electric Refrigeration Bureau were presented by G. B. Richardson, Texas director, at a meeting held here recently at the Baker Hotel, which was attended by power company executives and electric refrigerator distributors.

Those attending the meeting were: E. H. Kifer, San Antonio; F. C. Griswold, Dallas; E. Vennard, Shreveport, La.; J. P. Galloway, Dallas; W. J. Aicklen, Houston; Phil Bratton, Fort Worth; F. E. Cotton, Dallas; G. W. Jones, Dallas; L. D. Wittkover, Fort Worth; C. O. Dunten, Dallas; J. W. Harrison, Dallas; A. J. Shewmaker, Galveston; Parker Allen, Beaumont; B. W. McClerkin, Navasota; Hartwell Jalonic, Dallas; A. P. Bryant, Dallas; W. H. Merrick, Fort Worth; W. H. Fuller, Jr., Dallas; R. L. Johnson, Dallas; Stanley Campbell, Dallas; L. R. Ward, Dallas; M. W. Anderson, Dallas and R. E. Wallis of Dallas.

Plans outlined at the meeting called for the organization of local electric refrigeration bureaus throughout the state to carry out the national program.

PORTLAND BUREAU

Portland, Me.—Organization of a Portland Electric Refrigeration Bureau to co-operate with the National Electric Light Association in the drive to sell 1,000,000 electric refrigerators in 1931 was completed at a meeting of local refrigeration men March 18.

Roy E. Holden, sales manager of the Cumberland County Power and Light Co., was elected chairman and Guy C. Smith, advertising manager of the same firm, was elected secretary. Kenneth C. Allen, refrigeration sales manager of Cressey and Allen, was named treasurer.

Dealers and distributors representing Frigidaire, General Electric, Kelvinator, Servel, Copeland and Westinghouse attended the meeting.

SCRANTON DEALER EQUIPS HOSPITAL

Scranton, Pa.—Refrigeration equipment was recently placed in the Hahnemann Hospital of this city by the Automatic Equipment Co., Frigidaire dealer.

The equipment on duty in the hospital includes seven AP-4's, one AP-5, one AP-18, one 60 pound ice maker, one U compressor, two 560-F coils and two P-45 water coolers. Hooked up to the U compressor, the two coils refrigerate a walk-in box in the kitchen quarters.

ALEXANDER, OETTINGER, MORRIS TAKE NEW JOBS

Atlanta, Ga.—D. C. Alexander has been appointed sales promotion manager of the W. D. Alexander Co., General Electric refrigerator distributor.

Mr. Alexander succeeds W. E. Oettinger, who has been appointed commercial manager for the company. L. W. Morris has been made retail sales manager.

RENTAL OF WATER COOLERS PROFITABLE

By D. T. Hayward
Frigidaire Corp.

WHY should a building manager be interested in purchasing water coolers to lease to tenants? In the first place, one of the primary interests of a building manager is to keep his tenants satisfied. By providing them with a modern water cooler, the manager is giving them an additional service.

Many are now handling ice coolers and finding that there is very little profit in this type of business. The annoyance and inconvenience of ice along with the wear and tear upon the halls, the offices, etc., of the building is a constant bother as well as an expense.

The cost of elevator service is an item which should not be overlooked. It costs a definite amount of money for an elevator to make a single trip. Do you know what that cost is in each of your buildings? If one or two elevators are used from 5 to 7 o'clock in the morning by men carrying ice to coolers, figure out yourself what this service is costing.

Rental Companies in Big Cities

At the present time Frigidaire Corp. has rental companies handling their coolers in New York, Philadelphia, Pittsburgh, Cleveland, Chicago, St. Louis, Birmingham, and many other cities. The reason for this is that renting water coolers is a profitable business.

The building renting coolers to its own tenants can practically keep out any rental company because the tenant would much rather pay his bill all at once in one check.

Here is a breakdown of just what it would mean to buy 100 water coolers to be leased to tenants. We furnish either a bottled water cooler or a pressure water cooler at the same price. These coolers can be secured in the colors that harmonize best with the offices in the office building.

The list price of our coolers is \$175. We pay freight, cartage and warehouse, deliver the cooler to the ground floor of the office building and start it running when it is hooked up for \$15. The office building will take care of all plumbing and wiring. The total installed price will be \$190.

We are offering a 15 per cent special discount to buildings. This is \$26.25, making the installed price to the building \$163.75 or the cost of 100 coolers \$16,375.

Naturally, if we figure on the basis of 10 per cent depreciation we will be able to show a very attractive return on investment. But instead we are going to write the cooler off at five years and depreciate it at the rate of 20 per cent a year.

At this rate we will depreciate 100 coolers \$3,275 a year. Now, in renting these coolers to tenants it will be entirely up to you as to the amount of money you get per month for rental. However, we are going to show a breakdown and just what the return will be at various rental charges.

If the cooler is rented to tenants at the rate of \$4 per month this will mean a yearly income of \$4,800. Subtract the depreciation from this, you have a net income of \$1,525, or a return of 9 per cent on your money. If you rent the cooler at \$4.50 per month your yearly income increases, your net income increases and your return is 13 per cent.

Average Charge \$5.50 Per Month

Most rental companies charge \$5.50 per month. We believe this is a fair figure and we will use it for an ideal set-up figuring on a ten-year basis. The first year, of course, all service and inspection is free. After that, however, there will be a definite maintenance charge that will have to be set up. The Charles Hires Co. of Philadelphia, who have had experience with over 6,000 Frigidaire Water Coolers, state that to inspect, clean, paint and service it costs 38¢ per cooler per month.

Now the profit for the first year was \$3,325. The second year and the years thereafter we will naturally have to subtract the maintenance from this profit. In order to be safe, instead of setting up 38 cents per month we will figure the maintenance charge of 50 cents per month per cooler. This would be a total of \$600 for a year, which means that an annual profit for the next four years will be \$2,725.

At the end of this time the coolers are entirely paid for. From now on the annual gross income will be \$6,000, less of course, the maintenance of \$600 which will carry a net profit of \$5,400 per year.

Figuring that the cooler will last ten years (of course we believe it will last a lot longer) this represents the return. The first year the net profit is \$3,325. During the second, third and fourth years the net profit is \$2,725 per year or a total of \$10,900. During the next five years the net profit is \$5,400 per year or a total of \$27,000. This means that at the end of ten years a total return of \$44,225 has been made plus the fact that the equipment paid for itself in the first five years.

CENTRAL STATION MERCHANDISING ATTACKED

M. S. SLOAN FINDS NO CAUSE FOR ALARM

New York City.—"All this is politics," declares Matthew S. Sloan, president of the New York Edison System of electric light and power companies, referring to recent legislative attacks on the power industry.

"You cannot read a paper or magazine, particularly a magazine of the class which sometimes refers to itself as a 'molder of thought,' without being told that regulation has broken down," states Sloan.

"When you turn on your radio, you are likely to hear some governor or senator denouncing the power trust for its nefarious juggling of the law and plundering of the people. The halls of Congress and state legislatures echo the discussion.

"Public officials argue that the only way to curb the utilities and protect the public is by government ownership and operation of the electric business wherever possible now, and everywhere eventually.

"Those constant attacks tend to mislead those who will not trouble to learn the facts. They cause people to ask, 'Are politicians going to do to the utilities what they did to the railroads?' They tend to disturb public confidence in the industry. Then tend to upset investors and make raising future capital requirements more difficult.

"I have thought much over this situation, as every utility executive must have done. Politicians can do, they have done, queer things, foolish things, things harmful to business and against the public interest in the broad view.

"But they cannot, because it is politically unsafe, make radical changes in the relations of government with a great industry without strong popular support. Still more, they can't run counter to public opinion. They cannot overcome economic facts with political oratory.

"What is taking place is annoying, disturbing in some degree, but I see no reason for electric utilities to become alarmed, or for investors or prospective investors or prospective investors in utility securities to become alarmed.

"We shall have, undoubtedly, revision and strengthening of state laws regulating utilities. That is proper and desirable, and neither utilities nor investors have any reason for concern over it.

"It seems probable we shall have, sooner or later, some measure of Federal regulation over the interstate transmission of power. I am not convinced that it is necessary, but I can see no reason why the utilities can properly object to it.

"Attempts at Federal regulation of holding companies will be made. While I am not a lawyer, I see so many practical difficulties and hear of so many legal difficulties that I am sure any legislation which may eventually be adopted will be very carefully considered so that it may not be declared unconstitutional.

"In such case it will not restrict the initiative and freedom to act which are the advantages of the holding company, and which have enabled it to be such a powerful aid in the development of operating companies and the extensive improvement of utilities' service.

"The basic situation, to sum up, is as follows:

"The electric utilities have done an outstanding job. They have become a very large business. They serve the country at decreasing prices, and by and large they serve acceptably to the public. They have followed the economic trend of the times by mergers and groupings, and this disturbs a certain element of our population.

"But because politics cannot prevail over economics, their growth and development will continue. They are not perfect creations. Some of them have made mistakes. There are conditions and practices in the business which should be corrected. They will be, from within. I trust; certainly by official action and by strengthening of the laws regulating the companies, if corrective action does not come from the industry itself."

"That having been said, there remains only one disturbing possibility—that the people of our country will permit a business which has served them satisfactorily, as is proved by the record, to be scrapped, and will turn its job over to government. That I do not for one minute believe. It is contrary to our basic ideas. It is contrary to our experience.

"We have seen the results of government operation of railroads and shipping during the war period and since. There is no justification for it in logic or in fact.

"The electric utilities are a key business, one on which depend the progress and welfare of our nation. I see for them a future as prosperous as their present, a future of ever-widening usefulness, by which they will earn their prosperity."

'All This Is Politics'



Matthew S. Sloan, President, New York Edison Co.

Texts of Oklahoma, Illinois Measures

Complete Bill Passed By Oklahoma Legislature

ENROLLED
SENATE BILL NO. 96

BY MORRISON, REXROAT, COMMONS and STACEY, of the Senate, and McDOUGAL, KIRKPATRICK, WILSON, BLOCKER, LOGAN, PAXTON, GRISSE, GALBREATH, BROWN, DAVIS, and ROOPER, of the House.

An Act amending Section 5301, compiled Oklahoma statutes of 1921, relating to the creation of corporations, providing for the creation of private corporations and enumerating the purposes thereof, prohibiting public corporations from engaging in incidental lines of business in connection with the general business of such public service corporations; prohibiting the sale of merchandise, utensils and chattels not directly connected with and necessary to said general business by said corporations, its directors, officers, managers, agents or employees; providing a penalty for violation of this Act, repealing all laws in conflict herewith.

BE IT ENACTED BY THE PEOPLE OF THE STATE OF OKLAHOMA:

Section 1. That Section 5301, Compiled Oklahoma Statutes, 1921, be and the same is hereby amended to read as follows:

"Section 5301. Private corporations may be formed by the voluntary association of three or more persons upon complying with the provision of this chapter, for the following purposes, namely: mining, manufacturing, and other industrial pursuits; the construction of railroads, wagon roads, bridges and street railways, electric lights, power and gas plants, water works, irrigating ditches, colleges, seminaries, churches, libraries, benevolent, charitable, literary, educational, scientific and historical associations; building and investment companies, loan, trust and guarantee associations; merchandising, wholesale or retail, or both; for the purpose of locating, laying out, improving townsites, and buying and selling real estate therefor, including the sale and conveyance of the same in lots, subdivisions or otherwise, also for the purpose of constructing telegraph and telephone lines and systems; also for the purpose of conducting, carrying on, maintaining and operating automobile races; also for the purpose of conducting, carrying on, maintaining and operating baseball games and other public sports not prohibited by law, and for the organization and maintenance of commercial clubs and business exchanges, and all such corporations shall have the right to purchase, hold and improve and convey real estate for the purpose of their incorporation and to transact any and all business connected therewith: Provided, however, that all corporations coming within the definition of public service corporations as defined by the constitution and laws of the State of Oklahoma, shall be required to confine themselves strictly to the transaction of the business bringing such corporations within the definition aforesaid, and shall not be permitted to engage in incidental lines of business in connection with the general business of such public service corporation, directly or indirectly; provided, further, that all public service corporations shall be permitted to offer for sale and sell, in the ordinary course of business, all merchandise, appliances and commodities now owned by such corporations for sale and all merchandise and commodities as it may be necessary for such corporations to repossess for the purpose of affecting collection of the purchase price thereon, provided the prohibitions herein mentioned shall not prohibit railroads or common carriers from operating dining cars, dining rooms, and news stands. Corporations may also be formed for the purpose of constructing sewers and other municipal improvements, with the additional power of selling their property to municipal corporations where such improvements are located. All corporations organized for any of the purposes authorized by this section shall have the power to own and hold the stock of other corporations except as prohibited by the Constitution of this State."

Sec. 2. It shall be unlawful for any public service corporation in this state, directly or indirectly, to engage in the sale of merchandise, utensils, or chattels of any sort not directly connected with the general business of such public service corporation as authorized by its charter, except as herein before provided. Nothing herein shall be construed to prohibit any public service company from selling fuse plugs, electric light bulbs, outlet plugs, sockets, extension cords, or other repairs or equipment necessary to maintain continuity of service to any patron or patrons of such company.

Sec. 3. Any officer, director, manager, agent or employee of any public service corporation in this state who shall knowingly and wilfully violate, or knowingly and wilfully permit the violation of this Act, shall be fined in the sum of not less than One Hundred Dollars (\$100.00), nor more than One Thousand Dollars (\$1,000.00), or be imprisoned in the County Jail not less than one day nor more than twelve months, for each and every separate violation.

Sec. 4. All Acts and parts of Acts in conflict herewith are hereby repealed.

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Sec. 4. All Acts and parts of Acts in conflict herewith are hereby repealed.

PASSED by the Senate this the 3rd day of March, 1931.

ROBERT BURNS,

President of the Senate.

PASSED by the House of Representatives this the 10th day of March, 1931.

CARLTON WEAVER,

Speaker of the House of Representatives

APPROVED by the Governor of the State of Oklahoma this the 19th day of March, 1931;

WM. H. MURRAY,

Correctly enrolled

Dave Boyer,

Chairman, Committee on Engrossing and Enrolling.

NEVADA

(Concluded from Page 1, Column 5)

passed the Nevada house of representatives.

The measure was aimed chiefly at the merchandising activities of the Sierra Pacific Power Co., which serves a large part of Nevada.

MISSOURI

Jefferson City, Mo.—Representatives of hardware and furniture dealers' associations are encamped here to help support the Maxey bill, which would prohibit merchandising by public utilities in this state.

Already the Maxey bill has passed the House. It is now in the hands of a Senate committee. Members of the committee have questioned the constitutionality of the bill.

CALIFORNIA

Sacramento, Calif.—Still resting in committee archives is the bill introduced in the present session of the California legislature early in February with the purpose of prohibiting the sale of electrical and gas appliances by public utilities.

Senator J. M. Inman, of Sacramento, sponsor of the bill, claims that it is backed by electrical appliance dealers all over the state, who complain of the price-cutting activities of California utilities.

N. E. L. A. DISCLOSES WIRED HOMES DATA

Washington, D. C.—Electric power was served to approximately two-thirds of all the homes in the United States in 1930, according to the National Electric Light Association.

N. E. L. A. officials estimate that out of 30,000,000 American homes, 20,071,000 were using electricity. In the year of 1930, domestic consumption of electricity showed a gain of about 14 per cent over the 1929 rate.

This increase was nearly enough to offset the decline of 5.5 per cent in the use of electricity for power. Following is a table showing the estimated number of homes using electricity in each state:

State	Number
New York	3,043,000
Pennsylvania	1,710,000
Illinois	1,589,000
California	1,431,000
Ohio	1,319,000
Massachusetts	1,007,000
Michigan	943,000
New Jersey	924,000
Indiana	586,000
Texas	557,000
Missouri	555,000
Wisconsin	523,000
Minnesota	394,000
Maryland	377,000
Iowa	375,000
Washington	374,000
Connecticut	335,000
Kansas	281,000
Kentucky	229,000
Oklahoma	229,000
Florida	214,000
Virginia	209,000
Nebraska	202,000
Tennessee	199,000
Oregon	197,000
North Carolina	197,000
Georgia	194,000
Colorado	171,000
Rhode Island	159,000
Alabama	152,000
Louisiana	152,000
Maine	147,000
West Virginia	146,000
Utah	106,000
New Hampshire	101,000
Arkansas	98,000
South Carolina	96,000
Mississippi	80,000
Idaho	66,000
Montana	66,000
South Dakota	65,000
Vermont	61,000
Arizona	57,000
North Dakota	51,000
Delaware	35,000
Wyoming	30,000
New Mexico	27,000
Nevada	14,000

SMALL TOWN FAMILIES SEEM WELL EQUIPPED

Williamsport, Pa.—The following facts have been revealed about families in 29 small towns, having a population of less than 2,500 people, and located in West Virginia, Maryland, New York, Pennsylvania, and Virginia, by *Grit* magazine:

71.4 per cent own their homes.
88.4 per cent have electric light.
31.6 per cent have gas in the home.
45.2 per cent have telephones.
72.0 per cent have baths.
51.5 per cent own electric washers.
41.0 per cent own vacuum cleaners.
55.0 per cent own radios.
66.7 per cent own automobiles.
76.7 per cent had savings accounts.

1,000,000 UNIT CAMPAIGN STARTS IN MARCH 28 POST

Philadelphia—The March 28 issue of the *Saturday Evening Post* will carry the opening advertisement of the campaign sponsored by the National Electric Light Association to sell one million household electric refrigerators during 1931.

Following the double page spread, which will be signed by the Association, will be double page spreads by Frigidaire, General Electric, and Westinghouse, and single pages by Kelvinator and Leonard, making a total of 10 consecutive pages devoted to electric refrigeration in this one issue.

BARKER RESIGNS POSITION

Chicago—R. L. Barker has resigned his position as sales manager of the Peerless Ice Machine Co., and will devote his time to the LeBarque Co., in producing and selling his refrigerated beauty-aid inventions, Pakkold and Koldpak.

ICE-O-MATIC DISTRIBUTOR APPOINTED IN ST. PAUL

St. Paul, Minn.—The Motor Power Equipment Co. of this city has been appointed distributor for the Williams Ice-O-Matic line for Minnesota and western Wisconsin.

MARKET IN POLAND DEVELOPING SLOWLY

(Continued from Page 13, Column 5)
logues written in the Polish language will undoubtedly be more pleasing and receive greater attention on the part of local merchants.

The mails are open and letters and catalogues are being received without difficulty.

Although this list of Polish dealers in electric appliances has been carefully prepared, the Consulate General cannot assume any responsibility for the reputation or financial standing of any of the firms or individuals whose names it furnishes.

Credit reports can be obtained from banks specializing in foreign trade, or from commercial reporting agencies.

These names have been furnished by the American Consulate General, Warsaw, Poland. American Consular officers abroad will furnish similar lists to American firms or individuals requesting them.

The letter postage rate from the United States to Poland is five cents for the first ounce and three cents for each additional ounce or fraction thereof.

1. "Frigoria," Mazowiecka 11, Warsaw, Poland.
2. Bracia Borkowsky, Jerozolimska 62, Warsaw, Poland.
3. W. Komorowski, Jerozolimska 4, Warsaw, Poland.
4. Hugon Fried, Moniuszki 4, Warsaw, Poland.
5. Inzynierowie S. i P. Bergman, Krucza 2, Warsaw, Poland.
6. Jerzy Hirsowski, Kredytowa 4, Warsaw, Poland.
7. Jozef Boye, Chlodna 19, Warsaw, Poland.
8. Henryk Edelman, Chmielna 49, Warsaw, Poland.
9. E. Kuhn i Ska, Marszalkowska 71, Warsaw, Poland.
10. Malicki, Chmielna 9, Warsaw, Poland.

General Information

Location and Area: The Republic of Poland occupies the northeastern part of Central Europe, with an area of approximately 150,000 square miles, extending from the Baltic Sea south to the Carpathian range, and forming an intermediary state between Western and Eastern Europe.

The American Consulate General at Warsaw is the only American consular office in Poland.

Climate and Topography: The climate is somewhat similar to that along the border of the United States and Canada, but with less variation in temperature and an abundant fall of rain during the year.

Poland is a level country except for its southern sections adjoining the main range of the Carpathian mountains.

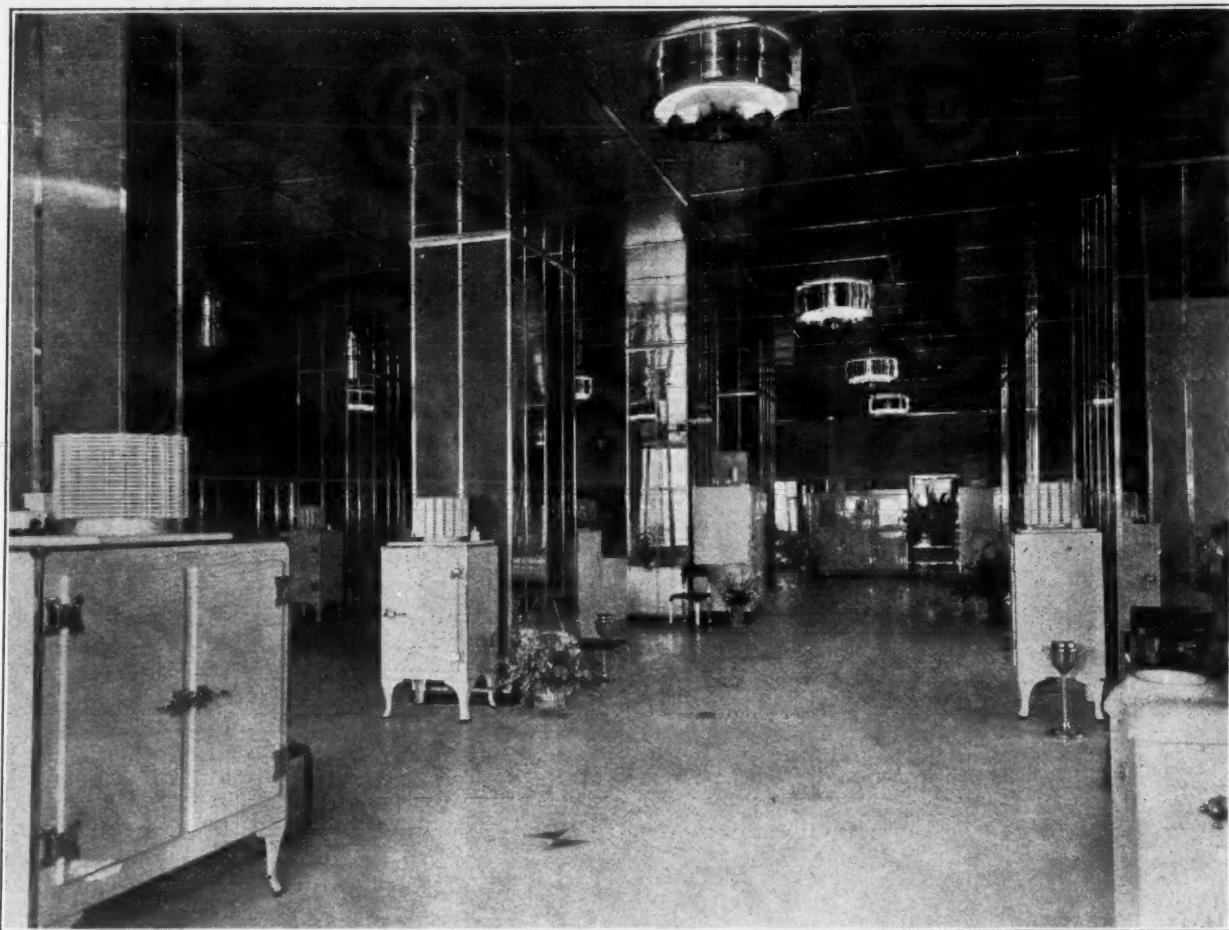
Population: Approximately 30,000,000; racially classed as 69.2 per cent Poles, 14.3 per cent Ruthenians, 7.8 per cent Jews, 3.9 per cent White Russians, 3.9 per cent Germans, and others 0.9 per cent.

Warsaw, the capital, has a population of 1,086,305. Lodz 597,183, Lwow 239,692, Wilno 190,172, Krakow 205,262, and Poznan 247,753.

Standards of Living and Wages: Standards of living are simple and similar to those of other parts of Eastern Europe. The average purchasing power is low as compared with the United States.

Laborers earn as little as \$0.40 a day,

R. Cooper, Jr. Opens \$100,000 Showroom



Partial view of striking new display room opened last week by Chicago G. E. distributor.

Chicago—A total of 753 persons attended the "Monitor Top" banquet held in the Drake Hotel, here, Wednesday night, March 18, to celebrate the opening of the new \$100,000 salesrooms of R. Cooper, Jr., General Electric refrigerator distributor.

In addition to the R. Cooper organization, were present representatives of the Illinois Power & Light Co., Illinois Northern Public Utilities Co., the Gary Light & Power Co., Indiana Public Service Co., and the Public Service Co. of Northern Illinois.

The Cooper salesmen sold 30,000 refrigerators last year, and plan to sell 45,000 this year. It was brought out in the meeting. Business for the first three months of this year is 40 per cent ahead of the same period during 1930.

Last year the sales promotion department of the General Electric Co. sent out 180 tons of literature. Literature orders were received from dealers at the rate of 400 per day, Cooper men were told.

The national organization will spend \$6,500,000 for advertising and sales promotion during this year. In visualizing

and skilled workers on the average \$0.78 to \$1.10 a day.

Customs Policy: In general, Poland's tariff is a protective one. Duties are usually specific and collected according to weight, while export duties and restrictions are imposed on a few articles.

Since August, 1924, import prohibitions have been in effect. These change frequently and cover many commodities which may not be imported except under special permits granted by the Ministry of Industry and Commerce.

Preferential customs duties are granted on certain commodities originating in countries enjoying "most favored nation" commercial treaties with Poland. The United States is now in this class



R. COOPER, JR.
Aggressive Chicago G. E. distributor.

this amount of money, Paul Dow told the group that if a 20-year-old man started collecting a \$1 bill from each person who passed past Times Square, New York, he would be 130 years old before getting the entire amount.

He claims that this appropriation represents the greatest advertising program of any specialty selling organization in the world.

It was pointed out that in May, 1927, the total national business of the G-E Refrigeration Department was \$6,000. In May, 1928, the daily business amounted to \$250,000.

Stress was laid on the following "Door Openers" provided by the Sales Promotion Department for the use of salesmen: recipe books, "Knight of the White Castle" story books, glass water bottles, glass rolling pins, bridge score cards, playing cards, salt and pepper shakers, and bridge table covers.

According to A. A. Chait, who electrified the crowd with an impassioned burst of oratory, the antonym for work is worry. "When you work you don't worry. When you worry you don't work," he said.

LITERATURE OF MANUFACTURERS

Catalogues, bulletins and other material recently issued.

Manufacturers are requested to send copies of new trade literature to Electric Refrigeration News.

Herrick

New commercial refrigerators, with coil compartments overhead, are announced by the Herrick Refrigerator & Cold Storage Co., of Waterloo, Iowa. In a pamphlet now being sent to the trade. Four models make up the new line, two having solid doors and two display doors. Storage capacities range from 48 cu. ft. to 78.31 cu. ft.

NORGE OFFICIALS SPEAK AT PHILADELPHIA MEETING

Philadelphia—Three hundred Norge dealers attended an all-day convention held by Trilling & Montague of this city March 19 at the Hotel Adelphia.

The morning session was opened by introductory remarks by David M. Trilling, who acted as chairman of the meeting. A talk by J. H. Knapp, vice-president of the Norge Corp. of Detroit, on the subject of merchandising refrigeration, followed.

At the afternoon session Howard E. Blood, president of the Norge Corp., spoke on the subject of production, design and performance.

Harry Terry, of the Cramer-Krasselt Co., Norge advertising counselors, addressed the meeting on "The Norge Advertising Program." He explained that nearly a half million dollars would be spent in the first six months of 1931 on Norge advertising.

Questions regarding the financing of the Norge refrigerator were discussed by S. M. Zinner, vice-president of Walter E. Heiler & Co., of Chicago, who spoke on "Time Payments as a Sales Tool."

REPRESENTATIVES ATTEND G. E. ACCOUNTING MEETING

Cleveland—An accounting conference was held March 23 and 24 at Refrigeration Institute of the electric refrigeration department, General Electric Co.

Distributor representatives from all sections of the country attended. The conference was headed by H. P. Smith, department auditor.

THE CONDENSER

ADVERTISING RATE fifty cents per line (this column only).

SPECIAL RATE if paid in advance—Positions Wanted—fifty words or less, one insertion \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each. All other classifications—fifty words or less, one insertion \$3.00, additional words six cents each. Three insertions \$8.00, additional words sixteen cents each.

POSITIONS AVAILABLE

SALESMEN for exclusive open territories to call on dealers of refrigerators, with a reliable line of refrigerator display material. Very attractive straight commission basis. Write selling experience and names of last two employers. Realistic Displays, Inc., 266 Fabyan Place, Newark, N. J.

POSITIONS WANTED

YOUNG man, married, at present profitably employed, desires position with growing power company or public service corporation in the capacity of refrigeration expert. Plenty of technical knowledge, but have not lost the ability to work. Two years' experience in General Electric factory. Will locate anywhere. Good references if desired. Box 319.

VALUABLE refrigeration and idea man desires position with growing company. Six years Frigidaire commercial supervisor. (Chicago territory.) Box No. 324.

REFRIGERATORS DISPLAYED AT HOME SHOW

Milwaukee—Automatic refrigerators were in prominence at the ninth annual Home Show held March 14 to 21 at the Milwaukee Auditorium.

Among those concerns displaying refrigerators at the show was the Schaefer Corp. (General Electric), Lindsay Automatic Refrigerator Co., (Frigidaire); Badger Radio Corp., (Majestic); George C. Beckwith Co., (Copeland); Gross Hardware Co., (Norge); T. M. E. R. & L. Co., (Kelvinator); and the Milwaukee Gas Light Co., (Electrolux).

It was estimated that more than 100,000 people visited the Home Show during the week. The grand award was a model home equipped with a model EA-5B Electrolux refrigerator.

Do You Want a Position?

For the man who is seeking a new connection, "THE CONDENSER" column provides the opportunity of placing his message before refrigeration executives at small cost.

Here is what a recent advertiser says: "I was particularly interested to learn what results could be expected with this type of advertisement and I am satisfied that your column is read by the type of executives I wanted to reach."

This column may also be used to advertise:

- POSITIONS AVAILABLE
- FRANCHISE OPEN
- FRANCHISE WANTED
- EQUIPMENT FOR SALE
- EQUIPMENT WANTED
- PROFESSIONAL SERVICES

See special rates at top of the Condenser Column

REALISTIC DISPLAY FOODS

WILL INCREASE YOUR REFRIGERATOR SALES

Our Display Foods are carefully designed to demonstrate capacity and usefulness, clearly.

Realistic Display Foods will not melt, soften, and are non-peeling, non-fading, washable and chemically hardened.

A COMPLETE UNIT DISPLAY OF 27 PIECES PLUS 8 FREE ITEMS

\$20.00 F. O. B. Factory

FOR THE SMALLER REFRIGERATOR

19 pieces plus 7 Free Items \$15.00 F. O. B. Factory

NOTE: Free items consist of qt. milk, 1/2 pt. cream, beverage, mayonnaise, can milk, butter, egg and cheese cartons, etc.

Realistic Displays, Inc.
Factory and Offices

266 Fabyan Pl. Newark, N. J.

SUBSCRIPTION ORDER

Electric Refrigeration News
550 Maccabees Building
Detroit, Michigan

Gentlemen: Please enter my subscription to ELECTRIC REFRIGERATION NEWS.

United States and Possessions: ☐ \$2.00 per year ☐ Three years for \$5.00
All other Countries: ☐ \$2.25 per year ☐ Two years for \$4.00

Refrigerated Food Section only \$1.00 per year.

I am enclosing payment in the form of ☐ Check ☐ P. O. Order ☐ Cash

Name.....

Attention of
or Care of.....

Street Address.....

City and State.....

Special Rates for Group Subscription Orders

For paid-in-advance subscriptions in United States only. Send check with order. Papers will be mailed to individual addresses.

5 or more subscriptions entered at one time, \$1.75 per year each.

20 or more subscriptions entered at one time, \$1.25 per year each.

10 or more subscriptions entered at one time, \$1.50 per year each.

50 or more subscriptions entered at one time, \$1.00 per year each.

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office.

The business newspaper of the refrigeration industry

ISSUED EVERY TWO WEEKS
VOL. 5, No. 15, SERIAL NO. 117Copyright, 1931, by
Business News Pub. Co.

DETROIT, MICHIGAN, MARCH 25, 1931

Entered as second class matter
Aug. 1, 1927, at Detroit, Mich.FIFTEEN CENTS PER COPY
TWO DOLLARS PER YEARTAYLOR MARKET
BOOSTS BUSINESS
WITH FOOD CASESDetroit Merchant Reduces
Operating Costs With
Electric Refrigeration

By John Drittler

Detroit—Converted to electric refrigeration about two years ago, James Taylor, who operates a grocery and market at the intersection of Grand River and Allendale Aves., here, states that electric cooling has materially reduced his refrigeration costs.

When the Taylor Market was changed over to electric refrigeration, two additional display cases were installed to take care of the steadily increasing business, as the store was located in one of the busiest residential sections of the city.

With three times as much business now, Mr. Taylor said, that his electric power bill averages about \$11 per month for the refrigeration equipment, electric grinder and slicer. Cooling the three "Dry-Kold" display cases, two 10 ft. in length, and the other 8 ft. in length, and the 8 ft. by 8 ft. by 10 ft. walk-in cooler, are two Kelvinator condensing units.

This compares, the Detroit merchant pointed out, with an average ice bill of \$45 per month in the winter season, and \$65 per month in the summer period, when the store had one display case and cooler and did considerably less business.

Minor adjustments to the system shortly after the installation were made by servicemen, and since that time Mr. Taylor reports that there has been no occasion to make a call for service.

Cutting off the market department are two 10 ft. display cases supplied by the Dry-Kold Refrigerator Co. of Niles, Mich., in which large stocks of fresh

(Concluded on Page 2, Column 5)

MEAT CASES PLACED
IN COLUMBUS MARKET

Columbus, Ohio—Installation of refrigeration equipment in the big Central Market here is now under way.

This market is unique in that it houses more than seventy independent butchers, who lease space and sell meat along an aisle a block long.

In the spring of 1930 a co-operative arrangement between the city and the market association provided that the city would remodel the building and renew the leases if the butchers would purchase sanitary equipment and provide for adequate refrigeration of the food.

Under this arrangement machine and case manufacturers were contacted and tests run on various types of equipment.

In January of this year most of the merchants placed orders for display cases with the McCray Refrigerator Co. of Kendallville, Ind., and the Herrill Co. of Columbus. These cases are of special design to provide ease of working without sacrifice of refrigerating efficiency.

The committee accepted proposals on refrigerating machines from several local dealers and scrutinized the specifications very closely. Approval was given on three prominent makes and the individual butchers were given the privilege of choosing their own equipment.

(Concluded on Page 4, Column 1)

WEBER COMPANY ACQUIRES
TWO COAST FIRMS

San Francisco—The Weber Showcase & Fixture Co., Inc., of this city, has just announced the acquisition of the American Woodworking Corp., of San Francisco, and the Rogers Cabinet Mfg. Co., of Seattle.

The name of the San Francisco organization will be changed to Weber American Co., Ltd., and that of the Seattle organization to Weber Rogers Co., Inc.

Facilities in the newly acquired plants will be immediately augmented. It is stated by the Weber Co. that the same management will be retained in both of the new organizations.

Locality Important,
Says McMillan

By George F. Taubeneck

St. Louis—It takes a good merchant in a good locality, with customers who demand quality goods, to make a success of quick-frozen foods distribution, believes W. B. McMillan, president of the Hussman division of the Allied Store Utilities Co.

"Intelligent people comprise the big market for quick-frozen foods now," McMillan declares.

"Wherever there are buyers who pop abreast of the times, and who are willing to pay for quality goods, the new sharp-chilled packaged products can be sold profitably.

"They are quality merchandise, and must be sold as such to a quality clientele," he concludes.

"We have refused to sell low temperature equipment to storekeepers who wanted to buy it," claims McMillan.

"It's our notion that quick-frozen

(Concluded on Page 2, Column 4)

HUSTON ORDERS 100
FRIGIDAIRE CABINETS

Montezuma, Ga.—Tom Huston Frozen Foods, Inc., has ordered 100 two-hole portable Frigidaire ice cream cabinets for retail outlets in Atlanta and other Georgia cities.

Groceries, drug stores and other food stores receiving these cabinets will use them for the storage of Frosty Morning orange juice, Frosty Morning peaches, and other quick-frozen foods and confections distributed by Tom Huston Frozen Foods, Inc.

The cabinets will hold a temperature of five degrees F. above zero.

Huston, whose wide distribution of "Tom's Toasted Peanuts" has given him plenty of working capital, plans rapid expansion of his frozen foods market.

Recently he completed a model plant in Montezuma for the freezing and packing of his new products, which include frozen peach and banana confections retailing for five cents.

Springfield Stores
Lose Cases

By C. G. Fairman

Springfield, Mass.—Considerable vantage ground in the sale of Swift's "Identifiable" meat cuts appears to have been lost in the removal of the display cases sent here by several manufacturers for use in retail stores handling the line.

While these quick-frozen meats are still handled by many of the dealers, they have reverted to the practice of using ice cream cabinets or delicatessen cases, keeping their stocks low, and making frequent replenishments from the local warehouse.

Swift & Co. is said to be looking for some kind of solution of the problem of sales and display which will enable its products to move with satisfactory volume at operating costs which will be mutually acceptable.

The wide fluctuation of sales during the week offers one of the biggest prob-

(Concluded on Page 2, Column 4)

MARYLAND MAY
HANDICAP FROZEN
MEATS RETAILINGLegislature Considers Bill
To Require License
For Merchants

Annapolis, Md.—Handicaps on the sale of quick-frozen food products in this state will be established if a bill introduced in the Maryland House of Delegates March 17 is passed.

This bill requires conspicuous markings (in large black letters half an inch high) of dates and places of freezing and inspection on all the packages of quick-frozen meats offered for sale in that state.

Quick-frozen meats must be displayed in containers maintained at a constant temperature of 28 deg. F. below zero, according to the provisions of the bill.

A license, granted after approval of the equipment and after the payment of a \$100 fee, would also be required of all merchandisers of quick-frozen packaged meats.

The bill was referred to the Committee on Hygiene after its first reading. It follows:

It shall be unlawful to sell, or to offer for sale, any articles of food which have been held for a period of thirty days or over in cold storage either within or without the state, without notifying persons purchasing or intending to purchase the same that it has been so held by the display of a placard plainly and conspicuously marked "Cold Storage".

(Concluded on Page 2, Column 5)

DR. RYAN TO DIRECT
KROGER FOUNDATION

Cincinnati.—Dr. Andrew H. Ryan, whose research activities in the fields of chemistry, physiology, and hygiene have been carried on in four American colleges, has been selected by President Albert H. Morrill to direct the recently established Kroger Food Foundation.

While serving professorships at Tufts College, the University of Maryland, and the University of Alabama, and lecturing at the Yale Graduate School, Dr. Ryan has been studying foods, nutrition and hygiene.

During the late war Dr. Ryan conducted research investigations into the health of munition workers for the U. S. Public Health Service. He was also a member of the Council of National Defense, and the National Research Council.

Dr. Ryan will select his own assistants. The organization he is to build will analyze all types of foods, and set up standards to be met by products sold in Kroger stores.

A bureau will also be conducted for the answering of requests for information made by housewives. Both manufacturers and housewives may submit food problems to the foundation for solution.

Foundation headquarters at Cincinnati will include, according to present plans, a bacteriological laboratory, an experimental kitchen, a dining room, reception and dressing rooms.

RETAIL FOOD PRICES DROP
IN 51 CITIES

Washington, D. C.—Retail food prices dropped in 51 cities during the month ending Feb. 15, according to statistics just issued by the U. S. Department of Labor.

Decreases of six per cent were reported for Detroit, Columbus, Denver, Houston, Indianapolis, Memphis, Norfolk, and St. Paul. Only one city, Mobile, exceeded this drop. Mobile food prices decreased 7 per cent.

For the year ending Feb. 15, retail food prices decreased 21 per cent in Indianapolis, Little Rock, and Memphis. Detroit prices dropped 18 per cent, while Jacksonville, Fla., reported a decrease of only 12 per cent.

These statistics, Labor Department officials claim, tend to disprove charges made during the last few months that retail food prices have remained high while farm produce prices were low.

All Set For Customers



Velvet carpets, reed furniture, floor lamps, and drapes make the Steak Shop in Toledo one of the most elaborate food shops in the city. McCray cases stock the ready cut meats, which are sold to customers by pretty waitresses.

KEOKUK GROCER PROFITS
WITH FROZEN FOOD LINE

Keokuk, Ia.—Substantial profits are being realized from the sale of Swift's quick frozen meats in Laubersheimer's grocery here, according to the proprietor.

"It doesn't take long for the good word to spread in a town this size," says Mr. Laubersheimer. "We have carried on an extensive local advertising campaign, and now almost everybody in Keokuk knows about these new food products and where to get them.

"Profits? Sure, we're making money—good money—from the sales of these meats. There's no waste, and the turnover is rapid. Women here are proud to place these meats before their guests and their families. The pride factor has been a big help to our sales," he declares.

A Mills low-temperature case and a Keokuk refrigerating machine are keeping the packaged "Identifiable" meats at proper temperatures, Mr. Laubersheimer states.

CANNERS GROUP TO BUILD
COLD STORAGE PLANT

Vancouver, Wash.—Washington Cannery Co-Operative Association of this city has made plans for the construction of a one-story, 100 x 100 and 80 x 370 ft. cannery and cold storage plant, at an estimated cost of \$75,000.

Machinery and equipment required will include boilers, engines, motors, cannery and cold storage equipment. Sutton & Whitney, Portland, Ore., are the architects.

In This Issue

Publication of a number of authoritative and highly informative special articles on the subject of display cases and commercial installations in this issue make it of special value to all who are interested in commercial refrigeration.

Particular attention is called to the article by D. E. Rutishauser, chief engineer of the Hussman-Ligonier Co., on the design and development of low temperature display cases and the story on estimating commercial installations by W. J. Aulsebrook, commercial sales engineer of Servel.

Among the special features of this issue are:

Display Case Design—Page 8, Refrigerated Food Section.

By L. K. Wright, Member, A. S. R. E. and N. A. P. R. E.

Frozen Foods Case Problems—Page 9, Refrigerated Food Section.

By D. E. Rutishauser, chief engineer, Hussmann-Ligonier Co.

Quick-Freezing Situation—Page 9, Refrigerated Food Section.

By W. E. Landmesser, commercial manager, General Electric refrigeration department.

Food Distribution Statistics—Page 10, Refrigerated Food Section.

Commercial Estimating—Page 1, Engineering Section.

MEXICAN OFFICER DENIES
REFRIGERATION RULING

Mexico City, Mex.—The exclusive use of electric refrigeration equipment is not compulsory for the meat markets and meat storage houses of the Mexican capital, and the proprietors of such establishments may use whatever type of refrigeration they desire, provided they comply with all requirements of the sanitary code.

This information was given a delegation of butchers and meat storage warehousemen of the Federal District, which includes Mexico City and several large municipalities, by Dr. Ulises Valdes, secretary general of the Department of Public Health.

Dr. Valdes declared that the department had never ordered, nor recommended, that electric refrigeration apparatus be used exclusively by the butcher shops and meat storage establishments.

(Concluded on Page 4, Column 1)

NEW YORK TO GET MORE
DELAMAT FOOD VENDORS

New York City—One hundred and fifty apartment house installations of refrigerated automatic food retailing machines are planned in the metropolitan area, according to the N. Robert Harvey System, Inc., which has begun operation of the first of its Delamat stores in the Beaux Arts Building.

The company is considering leasing units for use in groceries, drug stores and other retail establishments, where 24-hour operation might be desirable, although it will operate its own chain at the present time.

FROZEN FOODS MAKE HIT AT BIG DINNER

New York City—More than 325 members of the New York Section of the American Society of Refrigerating Engineers, their wives, friends and specially invited guests attended a Frozen Foods Dinner at the Hotel Governor Clinton, March 18.

More than 100 who sought reservations too late were unable to partake of the frozen food menu.

Eight different companies contributed the various products which comprised the dinner. The menu follows:

Fruit Cocktail
Hearts of Celery Mixed Olives
Cream of Spinach
Halibut Steak, Maitre d'Hotel
Fried Spring Chicken, Southern Style
Green Peas Corn Fritters
Apple Pie a la Mode with Apricot
Ice Cream
Moka
National Fruit Punch

The frozen foods served were contributed by the following companies: chickens and peas—General Foods Corp.; grapefruit, spinach and corn—H. C. Hemingway & Co., producers, Henry Kelly & Son, distributors; peaches and orange juice—Tom Huston Frozen Foods, Inc.; strawberries and apricots—Libby, McNeil & Libby; halibut steaks—Atlantic Coast Fisheries; apples—Fruit Machinery Corp.; orange juice—National Juice Corp., division of National Dairy Products Corp. The cellophane favors were contributed by the DuPont Cellophane Co.

Brief Talks Follow Dinner

Following the dinner brief talks were given by representatives of a number of the concerns mentioned above. Crosby Field, president of the New York section of the Society, introduced as toastmaster William Fellowes Morgan, Jr., president of the Brooklyn Bridge Freezer & Cold Storage Co.

Morgan introduced, as "the father of the frozen foods industry," Clarence Birdseye, of the General Seafoods Corp. "Eight years ago," Morgan reminded, "Birdseye was having difficulty in meeting his bills, but today he has attained outstanding success."

Birdseye evoked laughter in his reference to the fish which he stored in Morgan's warehouse in those early years, which, as far as he knows, are stored there still and are not paid for yet.

Suggesting that five minutes was far too little to tell the good points of frozen foods, Birdseye referred directly to several dangers which, he stated, represent various obstacles to the industry. He referred particularly to the troubles which derive from partial knowledge and the willful imitation of quick-frozen products which is already occurring.

The term "quick-freezing system," Mr. Birdseye indicated, is a misnomer ex-

New York A. S. R. E. Stages Frozen Foods Dinner



Some of the 325 persons who ate dinner composed entirely of frozen foods.

cept as it is applied to all the elements which enter into the preparation, distribution and sale of quick-frozen foods.

These include not only the method of actual freezing, but the proper selection of the product, the location of the plant, transportation facilities which prevent losses, and proper handling in the retail store.

The speaker referred to a strawberry concern which had invested much money in a perfectly good quick-freezing method, but which suffered great losses because the variety of strawberries selected for quick-freezing were entirely unsuited for this purpose.

In another instance, peas properly selected and properly quick-frozen, were made useless for consumption because of shipment at improper temperatures.

High Standards Emphasized

He also referred to the presence on the market of meats which were not representative of properly quick-frozen products.

In conclusion, the speaker urged that concerns entering this field should establish and maintain only the highest standards.

The next speaker, C. H. Robinson, of the Atlantic Coast Fisheries, Inc., stated that his concern, in addition to fish wholesalers, was using many other types of wholesale distributors, including general produce distributors, butter and egg distributors, meat packers, etc.

Careful transportation, Robinson emphasized, is an essential element in distribution. Proper protection and display in the retail store, the speaker stated, still presents some problems, and some retailers are reluctant to invest in low temperature equipment in addition to the equipment for the fresh products.

The old time prejudice against cold

storage, he indicated, also represents a problem; and there is necessity for co-operative industry action in interesting legislatures to withdraw obsolete cold storage laws which are disturbing the free flow of merchandise.

B. C. Coons, president of Fruit Machinery Corp., briefly stated that ordinary cold storage methods were suitable for frozen apples, and that the ordinary channels of distribution would be used.

Cellophane

J. D. Rankin, of the DuPont Cellophane Co., described the accident in a rayon factory in France from which the production of cellophane developed, and referred to its rapid application to the packaging of such diversified products as candy boxes, cigarettes, haberdasheries and frozen foods.

"Because cellophane stops dehydration and desiccation," Rankin stated, "it has a very important part to play in the frozen foods industry."

The final speaker was W. A. Johns, Jersey City Manager of Swift & Co. He referred to several accomplishments of refrigeration in combination with aviation. Seventy-two hours after the Graf Zeppelin left this country, 20 pounds of lamb chops which were part of its cargo were served in Berlin in excellent condition. The lamb chops had been packed in solid carbon dioxide.

In conjunction with the opening of a new airport at Newark, Johns stated, a dinner was served which had some contribution from every state in the Union. Beef tea from Kansas, strawberries from the Ozarks, potatoes from Idaho, oysters from Chesapeake Bay, and flowers from Los Angeles were among the products which had been packed in solid carbon dioxide and "flown" to the Newark destination.

The speaker then referred to the rapid

disappearance of bulk goods in the field of food products and the development of a brand consciousness among customers. He cited the following points in favor of quick-frozen meats:

1. They make the finest quality available to the public.
2. They reduce cost of distribution through the elimination of fats and trimmings at the meat packer's plant.
3. They permit of mass operating economies.
4. They improve savings in freight and distribution expense.

Instead of sending a complete carcass to one point, Johns pointed out, it is possible to divide the same on a basis of quality and cut preference, sending to one community all of the portions for which it is the best market, and to another community all of other portions for which it is the best market.

The future development in the sale of quick-frozen meats, he indicated, depends largely on the rate which retailers equip themselves with proper refrigeration display and storage cases.

In conclusion, he urged reciprocity and co-operation in the study of the industry problems.

Entertainment and dancing concluded the program.

LOCALITY IS IMPORTANT, SAYS HUSSMANN HEAD

(Concluded from Page 1, Column 2)

foods must be pioneered slowly and soundly. We don't want to sell any equipment to a store and then see that store lose heavily on its investment because of its unfavorable locality.

"If a few overanxious men begin to merchandise quick-frozen foods and then fail to make a go of it, the industry will suffer a black eye, and many well-qualified merchants will be scared out of the market," states McMillan.

A common fallacy among prospects for low temperature equipment, says McMillan, is that the addition of a line of quick-frozen foods will build up and even save a losing business.

According to the Hussman head, that time has not yet arrived. There is still some trail-blazing to be done before quick-frozen foods will rejuvenate a dying business.

The food retailer must be prepared, he maintains, to withstand losses on this new line for many months until his clientele becomes educated to the new products.

In the meantime, the retailer's other lines must carry the load.

STORES IN SPRINGFIELD LOSE DISPLAY CABINETS

(Concluded from Page 1, Column 4)

lems. The case question is also accounted an important factor in the situation here.

Rood & Woodbury, a large store which has been selling Birdseye Frosted Foods products, has reduced its low temperature equipment from two cases to one, and has moved its remaining case to the rear end of the store.

McKELLOGG RECEIVES APPOINTMENT

Cincinnati—C. S. McKellogg has been appointed food and drug inspector in the U. S. Department of Agriculture. He will work from the Cincinnati office, covering Ohio, Indiana, Kentucky and Tennessee.

BALDWIN COMPANY QUILTS

Burlington, Vt.—The Baldwin Refrigerator Co., manufacturers of ice boxes, has voted liquidation proceedings and will retire from business.

Ernest E. Smith is president of the company, which, despite the decision to discontinue, is solvent.

FOOD CASES HELP SALES IN MARKET

(Concluded from Page 1, Column 1)

meats are stored in a temperature approximating 40 degrees. One of the cases is used entirely for meats, the other storing sausage meats.

Directly in the rear of the store is the large walk-in cooler in which the larger cuts of meats are stored. This cooler is maintained at a temperature averaging from 38 to 40 degrees.

Two of the cases and the cooler can be seen in the photograph of the market which appears on page 12 of this section.

In the grocery section an 8-ft. case stocks dairy products, consisting of milk, cream, and a large assortment of cheese. Like the other two cases, it is also operated at a temperature of 40 degrees.

Coils in the cases and cooler are given a general defrosting about every three weeks, according to Mr. Taylor. Each Saturday night, supplies in the three cases are removed to the walk-in cooler which is kept in operation over the week-end.

The multiple hook-up of the system allows for the shutting down of the three cases. In this way the cases can be given a thorough cleaning each week and the frost which has accumulated on the coils melts away.

Located in the basement, the two units installed by the Kelvinator-Detroit branch are of 1 and 1½ h. p. respectively. The 1 h. p. unit operates the cooler and one of the 10 ft. cases, while the larger unit is connected to the other two cases.

MARYLAND MAY HANDICAP SALES OF FROZEN FOODS

(Concluded from Page 1, Column 5)

age Goods" on the bulk mass or articles of food; and it shall be unlawful to represent or advertise as fresh any article of food which has been held in cold storage for a period of thirty days or over; and provided further that it shall be unlawful to sell or to offer for sale any frozen steaks, chops or roasts from beef, veal, lamb and pork, also sausage or sausage products in package form to the consumer ready for cooking and consumption unless the following provisions and requirements are complied with:

All packages of frozen package meats intended for sale as aforesaid shall be conspicuously marked in bold faced Gothic capital type at least a half inch in height with the following information:

- (1) The date of freezing;
- (2) the place of freezing;
- (3) name of the packer;
- (4) the name or designation of the inspector at the place of freezing and packing, certifying to his inspection and to the fact that the package has been permanently sealed.

That in all places where frozen package meats are sold there shall be displayed on the four sides of the room a sign not less than six inches in height, the words "Frozen Package Meats Sold Here."

That it shall be unlawful to sell frozen package meats unless the said packages are kept on display for sale in containers maintained at a temperature at all times of 28 degrees below zero, and that the said frozen package meats shall be so displayed as to have visible to the prospective purchaser the markings required thereon by the provisions of this article.

And provided further, that no person, firm or corporation shall maintain or operate a container for the sale of frozen package meats without a license to do so issued by the Secretary of the State Board of Health.

Any person, firm or corporation desiring such a license shall make written application to the Secretary of the State Board of Health for that purpose, stating the location of the container.

The Secretary of the State Board of Health thereupon shall cause an examination to be made of said container and, if it be found to be in a proper sanitary condition and otherwise properly equipped for its intended use, it shall issue a license authorizing the applicant to operate the same as a container for frozen package meats during one year.

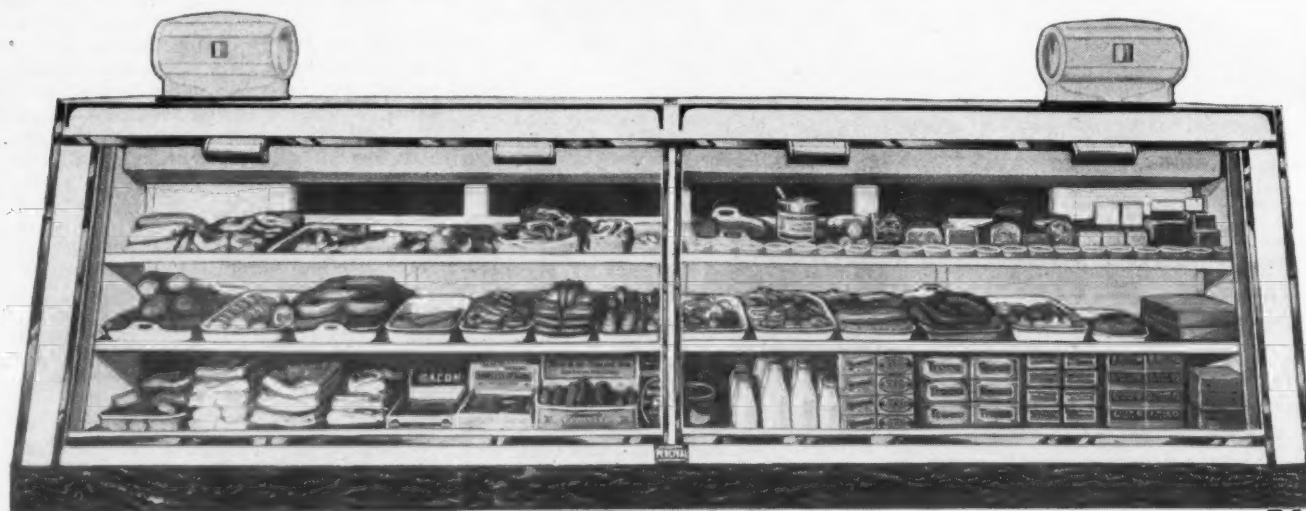
The license shall be issued upon payment by the applicant of a license fee of \$100.00 to the Treasurer of the State.

HOSPITALS STORE RADIUM IN KELVINATORS

Boston—Approximately \$500,000 worth of radium is stored in two Kelvinator refrigerators in two hospitals of this city, according to Harry Troutwine, manager of the Boston Kelvinator branch.

The Palmer Memorial Hospital uses a Leonard cabinet cooled with Kelvinator equipment to keep radium supplies and equipment at a temperature near the 40 degree mark.

At the Collis P. Huntington Memorial Hospital, radium is also kept in a specially equipped Kelvinator.



The PERCIVAL Line

REFRIGERATOR DISPLAY COUNTERS

In the Percival Line of seven Refrigerator Display Counters, you will find a counter for every purpose and every purse. Five types exclusively for mechanical refrigeration—two types for either mechanical refrigeration or crushed ice and salt.

With this line, excellent opportunities now exist for QUICK SALES among grocers and markets everywhere. QUICK SALES at good profits. Write us today on your letterhead for Percival's proposition. Mention other lines handled.

C. L. PERCIVAL COMPANY
11th & CHERRY ST. DES MOINES, IA.

ESTABLISHED 1866 • QUALITY REFRIGERATOR COUNTERS SINCE 1912

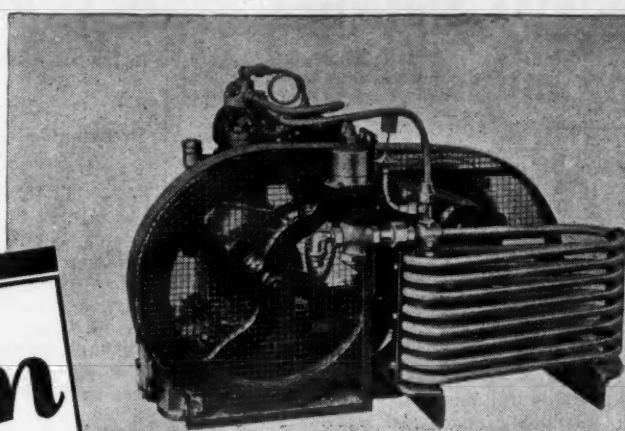
Note how this line of
PERCIVAL
Refrigerator Counters
Meets Every Need

Monel-trimmed, porcelain—Overhead coiled—Insulated with Armstrongs Cork Board.

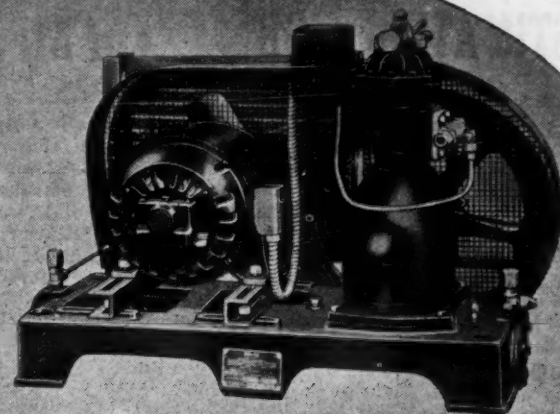
No. 200—Three-shelf ALL Display.
No. 310—Top Display Only.
No. 410—Combination Display and Storage.
No. 710—Divided two-temperature.
No. 810—Combination Display and Storage. One end for 20°—One end for 40°.
No. 800—All Freezer—Combination Display and Storage. All one temperature at or below 20°.

Can be used with crushed ice and salt.
No. 325—Top Display only. Back coiled.
No. 610—Combination Display and Storage. End coiled.

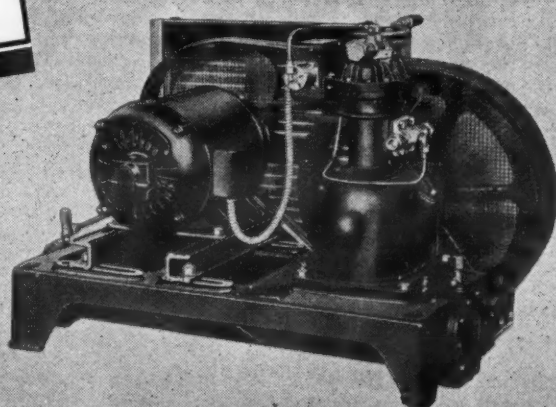
Refrigeration PLUS!



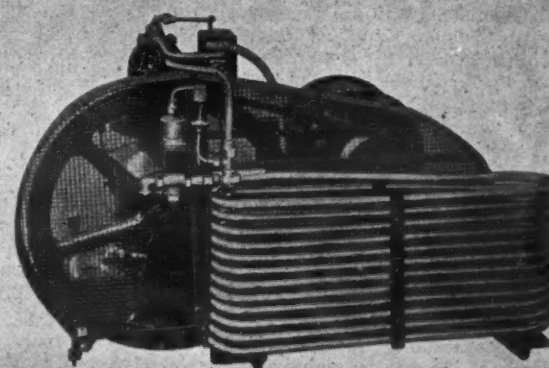
Model 20-AW (Water Cooled) 1/8 Ton



Model 50-C (Air Cooled) 1/4 Ton



Model 75-B (Air Cooled) 1/2 Ton



Model 125-AW (Water Cooled) 3/4 Ton

NOW . . . 16 NEW IMPROVED MODELS FOR EVERY COMMERCIAL USE

HERE'S tremendously important news! A completely redesigned line of Servel Commercial models! So flexible, so powerful, that they meet every requirement for fractional-ton refrigeration.



New water-cooled Servel machines are equipped with highly efficient double-tube condensers.

These modern machines retain the rugged construction and precision workmanship that have established Servel leadership for more than a decade. And they embody vital changes in design that make them easier to sell—simpler to install—more economical to operate.

MODERNIZED REFRIGERATION

Check Servel's advancement with the demands of your sales force, with the suggestions of your service men, with the requirements of your prospects. Then you will realize that many of these improvements have not previously been available—that here is the newest note in 1931 commercial refrigeration.

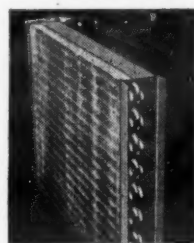
Servel gives you oversized, highly efficient condensers of both the water-cooled and air-cooled type—entirely interchangeable so that a water-cooled model can be converted into an air-cooled model for quick delivery.



Multiple Vee-belt drives guard against service interruption; reduce wear and noise.

Universal motor bases permit the mounting of different sizes, types and makes of motors to fit local conditions. Uniformity of valve and tubing sizes, and controls, simplifies installation and service.

LESS OPERATING COST



Perfect air draught control is provided by shrouded condensers on air-cooled models.

These advanced Servel machines operate with greater efficiency, at a slower speed—resulting in less wear, less operating cost.

Large receivers have been built into the bases to provide ample reserve charges. All models are equipped with a liquid level test-cock; condensers can be repaired or replaced without disturbing the refrigerant charge. A shock absorber robs the water valve of all chatter. Three-leg suspension eliminates installation problems where floors or foundations are uneven. Lengthened pistons reduce wear, and extra long connecting rods produce more pounds of ice per KW consumption.

SEND FOR FULL DETAILS

And so on, through the long list of definite selling-points—accessibility of all important parts—compactness—multiple Vee-belt drives that insure uninterrupted service—non-sticking snap-action controls—every feature contributes vastly to the simplicity, efficiency and performance of the new Servel models.

Add to these superiorities the fact that you can sell Servel at prices no higher than the cost of ordinary refrigeration.

Finally, send the coupon below for a full description of the new Servel Commercial Line—and complete details of the attractive new Dealer Plan that insures more profitable business for you.

“O”

FIVE KEY POINTS

New-style condensers—Interchangeable; more highly efficient.

Multiple Vee-belt drives—Insuring uninterrupted service and quiet operation.

Large receivers in base—Carrying ample charge at all times; no loss of refrigerant during repairs.

Economical operation—Low-speed compressors; greater refrigeration for current used.

Wide range of 16 models—With capacities of 130 lbs. to 15.0 lbs. of ice equivalent-per day.

SERVEL SALES, Inc.
EVANSVILLE, INDIANA

Manufacturers of a complete line of commercial and household electric refrigerating machines.

There is no Substitute for Experience



MEMO
Servel Sales, Inc., Dept. H-1,
Evansville, Indiana.
Gentlemen: I am interested in
further details about SERVEL
Refrigeration PLUS.

NAME

COMPANY

CITY AND STATE

AULSEBROOK HELPS ON ESTIMATING JOB

(Concluded from Page 1, Column 1)

Hercules Body Sales Co., Servel distributor, has submitted proposals to every merchant in the market, and have, to date, been awarded 13 complete contracts totalling approximately \$8,000.00, of which six machines have been installed.

The Servel factory has co-operated very closely with the distributor in connection with the sale. W. O. Dunn, district manager, contacted the committee initially and W. J. Aulsebrook, commercial engineer for Servel, came to Columbus from Evansville to assist in calculating the widely varying needs of the various merchants.

All Servel equipment is being installed under the direction of Paul Reed, factory service engineer.

Market Association members who have purchased Servel to date are as follows: Al Gronbach, William Schaad, Thomas Smith, August Zapp, Wotring & Ottilie, E. Statmiller, F. Devereaux, Frank Vetter, C. T. Leindecker, Tussing Bros., W. H. Sanderson, A. J. Clark, and Frank Miller.

MEXICAN OFFICER DENIES REFRIGERATION RULING

(Concluded from Page 1, Column 4)

He said that while some of the department's inspectors may have recommended the use of electric refrigeration apparatus, that action was merely a private one of the inspectors, and without the orders of the department.

The official asserted that the department could not officially recommend nor even suggest the use of any particular type of refrigeration apparatus, because such action would constitute a violation of the federal constitution which prohibits monopolies.

The delegation was backed by the Association of Ice Manufacturers of the Mexican Republic. Arnulfo Mancera was the chief spokesman.

The Union of Butcher Shop Proprietors of the district held a meeting recently at which the question as to whether the sanitary code demanded that all butcher shops must use electric refrigeration cabinets was discussed. It was decided to take the matter up with the Department of Public Health.

While several of the more modern Mexico City butcher shops and meat storage houses are equipped with electric refrigeration, the great majority of these establishments are using ice refrigeration.

These proprietors were much alarmed by the report that the department was demanding the exclusive use of electric refrigeration apparatus, as they feared the expense of making such installations, especially now when the economic depression is particularly acute in this country.

BAKER SYSTEM ORDERED BY UNIVERSITY

La Jolla, Calif.—The Scripps Institution of Oceanography, to be erected here at a cost approximating \$120,000, and to be conducted as a branch of the University of California, will require refrigerating equipment totalling \$12,200.

The contract has been awarded to the Baker Ice Machine Co.

Census Bureau Tabulates Statistics On Meat Packing Industry for 1929

Washington—The Bureau of the Census announces that, according to a preliminary tabulation of data collected in the Census of Manufacturers taken in 1929, the total value (f. o. b. factory prices) of the 1929 output reported by establishments in the United States engaged primarily in meat packing amounted to \$3,394,672,995, an increase of 11 per cent, as compared with \$3,057,215,718 reported for 1927.

The total for 1929 is made up as follows: fresh beef, 4,004,363,714 lbs., valued at \$864,480,444; fresh veal, 510,235,304 lbs., \$106,938,915; fresh mutton and lamb, 600,805,058 lbs., \$144,291,993; fresh pork, 3,549,828,048 lbs., \$598,342,274; edible organs (livers, hearts, brains, tongues, tripe, etc.), 577,359,195 lbs., \$64,265,513; cured beef, 71,157,506 lbs., \$21,748,985; cured pork, 3,488,382,409 lbs., \$660,923,794; lard, 2,033,029,337 lbs., \$246,065,758; other products, \$687,615,319.

Comparing 1929 with 1927, the figures for beef show a decrease of 9.2 per cent

in quantity as against an increase of 13.4 per cent in value; those for veal, a decrease of 7.2 per cent in quantity, with an increase of 8.6 per cent in value. For mutton and lamb and pork, however, both quantities and values show increases at similar rates, namely, 9.7 per cent for quantity and 10.8 per cent for value of mutton and lamb, and 14.1 per cent for quantity and 15.5 per cent for value of pork.

This industry, as defined for census purposes, embraces establishments engaged wholly or principally in wholesale slaughtering and meat packing, including abattoirs engaged wholly or chiefly in custom slaughtering.

Plants that slaughter mainly for the retail trade but also sell at wholesale considerable quantities of meats are included, and the reports made by such establishments generally cover both branches of their operations. Establishments slaughtering for the retail trade only do not come within the scope of the census.

Summary for the Industry: 1929 and 1927

	1929	1927	Per cent of increase or decrease (—)
Number of establishments.....	1,244	1,250	—0.5
Wage earners (average for the year) ¹	121,246	119,095	1.8
Wages ²	\$164,487,568	\$161,583,827	1.8
Cost of materials, containers for products, fuel, and purchased electric current ³	\$2,938,028,285	\$2,663,740,403	(3)
Value of products ⁴	\$3,394,672,995	\$3,057,215,718	11.0
Value added by manufacture ⁵	\$456,644,710	\$393,475,315	(4)

¹Not including salaried employees. The average number of wage earners is based on the numbers reported for the several months of the year. This average somewhat exceeds the number that would have been required for the work performed if all had been continuously employed throughout the year, because of the fact that manufacturers report the numbers employed on or about the 15th day of each month, as shown by the payrolls, usually taking no account of the possibility that some or all of the wage earners may have been on part time or for some other reason may not actually have worked the entire month. Thus in some cases the number reported for a given month exceeds the average for that month.

²Manufacturers' profits cannot be calculated from the census figures because no data are collected for certain expense items, such as interest on investment, rent, depreciation, taxes, insurance, and advertising.

³The cost-of-materials item for 1927 is not strictly comparable with the corresponding item for 1929 because of the fact that the schedule for 1927 provided for the inclusion of data on the cost of shop supplies, whereas that for 1929 stated that such data should not be included. For this reason no per cent of increase is presented.

⁴Value of products less cost of materials, containers for products, fuel, and purchased electric current. The figure for 1927 is not strictly comparable with that for 1929 because of the change in the cost of materials item. (See footnote 3.)

New Industrial Refrigeration Projects

Mitchell, S. D.—Equity Union Creamery Co., of this city, has plans prepared for a one-story 75 x 92 ft. creamery plant, including refrigeration equipment, at an estimated cost of \$65,000. J. Hammer is manager, and F. W. Kings is architect.

Minneapolis—A contract for a one-story fruit storage building at 9th Ave. South and Second St., was recently awarded to Pike & Cook, of this city by the Chicago, Milwaukee, St. Paul & Pacific Ry. Co. The estimated cost was \$100,000.

Morristown, N. J.—The construction of a dairy plant at an estimated cost of \$40,000 is being considered by the Bendora Farms.

Kansas City—Collins Construction Co., of this city, has received a contract for a two-story dairy plant at 15th and Benton Sts., from Summe Dairy Co.

Pittsburgh—A contract has been awarded by the Corliss Creamery Co. of this city for the construction of a two-story 98 x 160 ft. dairy plant to Schultz, Schreiner & Clyde, Pittsburgh.

COMMERCIAL EQUIPMENT DISPLAYED AT FOOD SHOW

Canton, Ohio—Large delegations of butchers, grocers and bakers from towns within a radius of 50 miles attended the Food Show held in this city during the week of March 9.

The local Frigidaire agency under L. S. McCray Co. operated with the Canton Provision Co., meat packers, in its large display of products. Two McCray cases cooled by Frigidaire units were used to show a large variety of meats.

Commercial Frigidaire models were used in the Borden booth, where many kinds of cheese were displayed; in the Standard Brands exhibit to cool molded gelatines and yeast; and in the S. M. A. booth, which featured canned milk and cream.

A local produce company utilized a General Electric commercial refrigerator supplied by the Willis Co., distributor, to display 32 kinds of fresh fruits and vegetables.

Both the Willis Co. and the Frigidaire agency showed household models at their exhibits. In the model kitchen, where free cooking lessons were given to women each afternoon, a Frigidaire cabinet was in operation.

BRANDT CO. BANKRUPT

Cleveland—The Brandt Co., distributor of food products, has been declared bankrupt. All property, including refrigeration equipment for meat, poultry and fish will be sold at auction.

N. Y. Markets Save With Electricity

By K. S. Baxter

President, Copeland Refrigeration Co. of New York

ELECTRIC refrigeration is rapidly gaining in favor as a method of preserving meats, fish and other supplies in modern markets.

For example, there is the Roosevelt Market of Jackson Heights, Long Island. This market is equipped with Copeland electric refrigeration.

It has one walk-in cooler, 10' x 10' x 12'; three double duty display cases 14 ft. long, and one dairy box for dairy products, milk, butter, eggs and cheese. Refrigeration is provided by three compressors. The decision to install electric refrigeration was reached after a most thorough investigation on the part of the Roosevelt Market.

Another market using electric refrigeration is that of the Modern Beef Co., of Astoria, Long Island. This market was formerly equipped with an ammonia plant. After talking with various users of electric refrigeration systems, Mr. Schoen of this company decided to install new refrigeration equipment.

The Copeland system cools an 8-ft. fish display case, in which the refrigerating coils are placed in the bottom, with rack just above the coil. The ice and fish are packed on top of this rack.

The two 8-ft. display cases and one poultry display case are also refrigerated. In the poultry case a temperature of 28 to 34 degrees is maintained. The other display cases are kept at a temperature ranging from 39 to 45 degrees. The corned beef tank is operated at a temperature from 32 to 36 degrees. The walk-in cooler is kept at 34 to 38 degrees.

In addition both street display windows are likewise equipped with electric refrigeration units, which hold the temperature of the windows at 34 to 36 degrees. The coils are hung overhead and do not frost.

Since the installation of the new equipment the interior of the market has been done over in white and black.

Charles Hoffman, of Hollis, N. Y., installed an electrically cooled 16-ft. double duty case and a 12' x 13' x 10' walk-in cooler. Two compressors are used to cool the equipment.

He reports that his ice bills formerly amounted to \$55 a month, but that the largest bill he has ever paid for electricity was but \$16.10 per month.

Herman B. Holm, of Flushing, N. Y., installed electric equipment to cool a 10' x 8' x 10' cooler, a single glass Wicke case and a 6-ft. window display case. The temperature of the cooler averages around 35 degrees, that of the Wicke case about 40 degrees, and the window display case 39 degrees.

His electric bills run from \$12 to \$15 a month. "I buy in larger quantities and save on trimmings," Mr. Holm says.

Rath's Market, Brooklyn, installed a Copeland system to refrigerate a 10' x 10' x 12' cooler and 20-ft. single glass case.

The results were so satisfactory that he ordered equipment to be installed in the 10' x 8' x 10' walk-in cooler, 20-ft. single display case and corned beef tank in his other store.

"My August, 1930, electric bill for refrigeration," says Fred Rath, "was \$18, as against my ice bill of approximately \$75 for August prior to the installation of these machines. I consider this a great saving over ice, and have the added pleasure of convenience and the same automatic temperature at all times."

Another merchant who recommends electric refrigeration is Henry Blendermann, of Blendermann Brothers, proprietors of the Kew Garden Market, Kew Gardens, N. Y. A 10' x 12' x 12' cooler and a 14-ft. double duty case are Copeland equipped. The temperature in the cooler averages from 35 to 37 degrees, and in the case 38 to 40 degrees.

"My meats keep wonderfully," he says. "There is no loss in weight or turning in color. My total electric bill from December 1, 1930, to January 12, 1931, was but \$7.84. The amount was so small as compared with ice that I thought a mistake had been made. My ice bills averaged from \$75 to \$85 a month."

ARMOUR OF DELAWARE DECLARES DIVIDEND

Chicago—The board of directors of Armour & Co. has declared the usual quarterly dividend of \$1.75 per share on outstanding preferred stock of Armour of Delaware, and \$1.50 per share on the outstanding preferred stock of the North American Provision Co.

It was decided at the board meeting held here recently not to pay a dividend this quarter on the Armour of Illinois stock. President T. G. Lee states:

"While inventories at the beginning of our fiscal year on November 1 were in a generally satisfactory position, there has been a continually declining market for our products since that time."

"In common with commodities in general, many packing house products have dropped to record low levels in the past few months."

DRY POULTRY PLAN REQUIRES CHILLING

By W. F. Dorfinger

Manager Commercial Sales
Caswell-Stull, Inc., Detroit

GOVERNMENT authorities believe the dry plan of marketing poultry to be the best. This consists of preventing water from touching the fowls from the time they are killed until they reach the consumer. This method means less infection and the conservation, so far as possible, of all good elements.

At a plant where this method is used, the birds are put in a refrigerated room immediately after being killed and plucked. They are chilled as soon as possible after killing, for a good supply as chicken, together with warmth and moisture, rapidly breeds bacteria.

A temperature of 30° F. in the refrigerator room, however, arrests the development of germs. In live poultry and animals toxins are continually developed which destroy the bacteria, but when the bird or animal is dead these are no longer developed. That is why the germs develop so much more rapidly in a dead or dressed specimen.

When the stock is thoroughly chilled it is packed in boxes and shipped in refrigerator cars. If the packer does not have a carload a week, the stock is frozen in the refrigerator rooms at a temperature of zero to 5° F.

It is frozen at this low temperature so that it will freeze quickly and thoroughly. At 28° F., which is below "freezing," the carcasses would "case," that is, they would freeze on the outside before all the heat was out of the inside and the bird would decompose on the inside, and when brought out and displayed in the butcher shop, the decomposition would not be long in working through.

If the stock is not to be frozen hard, but is to be loaded in cars, it is packed at a temperature of 30°.

Poultry should be kept at a temperature of as near 32° F. as possible until it reaches the consumer.

When it is recalled that the time required by the commission man to dispose of his stock, the time that the retailer keeps his goods before being sold, and the day or two that the housewife may keep the fowls before cooking them, it will be recognized that every step in the handling of dressed poultry demands perfection of detail if the product in our markets is to be good.

Many retailers adopt the practice of obtaining a fresh supply of chickens daily from the wholesaler.

This practice is a good one and generally insures the ability of the retailer to supply the consumer with birds of good quality.

Poultry does not keep in prime condition in average ice box, where the temperature is about 45° F., and poultry held at this temperature should be disposed of in a day or so.

A & P FEBRUARY SALES SHOW SLIGHT DECLINE

New York City—Sales of the Great Atlantic and Pacific Tea Co. amounted to \$82,384,806 for the month of February, a decline of \$3,737,012, or 4.34 per cent, as compared with \$86,121,818 for the same month of 1930.

Since the volume of goods sold was greatly increased, the company states that the decline in dollar sales is due to lower retail food prices.

Measured in tons, it is found that the actual quantity of goods sold in February of this year is 10.72 per cent greater than in the month of February, 1930.

February, 1931, showed the highest average weekly tonnage in the history of the company. December, 1930, had the next high figure and the third highest was recorded in January, 1931.

Estimated in tons, the sales of the company amounted to 443,516, compared with 400,586 in the month of February, 1930, an increase of 42,930.

Average weekly tonnage estimated was 110,879, compared with 100,147 a year ago, an increase of 10,732.

In February, 1931, the average weekly dollar sales were \$20,596,202, compared with \$21,530,454, a decline of \$934,252.

MIAMI RESTAURANT BUYS EQUIPMENT

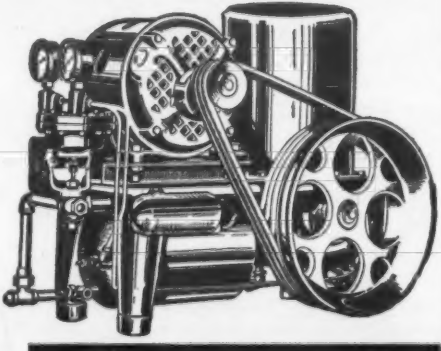
Miami, Fla.—The Frigidaire Sales & Service Co. of this city has completed a large installation in the China Royal Restaurant at 8 S. E. First Ave.

One large storage box, 1 small storage box for ice cubes, meats and vegetables, an ice cream cabinet, a water cooler of 25 gallon capacity, and a small salad cooler were included in the order.

NEW WILSON WAREHOUSE

Chicago—Wilson Packing Co. is planning the construction of a two-story 75 x 150 ft. cold storage warehouse at Crockett and Jefferson Sts., Beaumont, Tex. The estimated cost is \$85,000.

What a
• Field!
What a
• Machine!



There's an increasing tendency in modern food merchandising to get displays OUT FRONT where customers can see them.

The day of the hidden stock of perishables is passing. Such merchandise is now placed IN FRONT where its wholesome attractiveness coaxes buyers into making extra purchases.

Refrigerating such displays offers one of the greatest markets in the refrigeration field and Excelsior is winning a place in that market which is interesting live dealers everywhere.

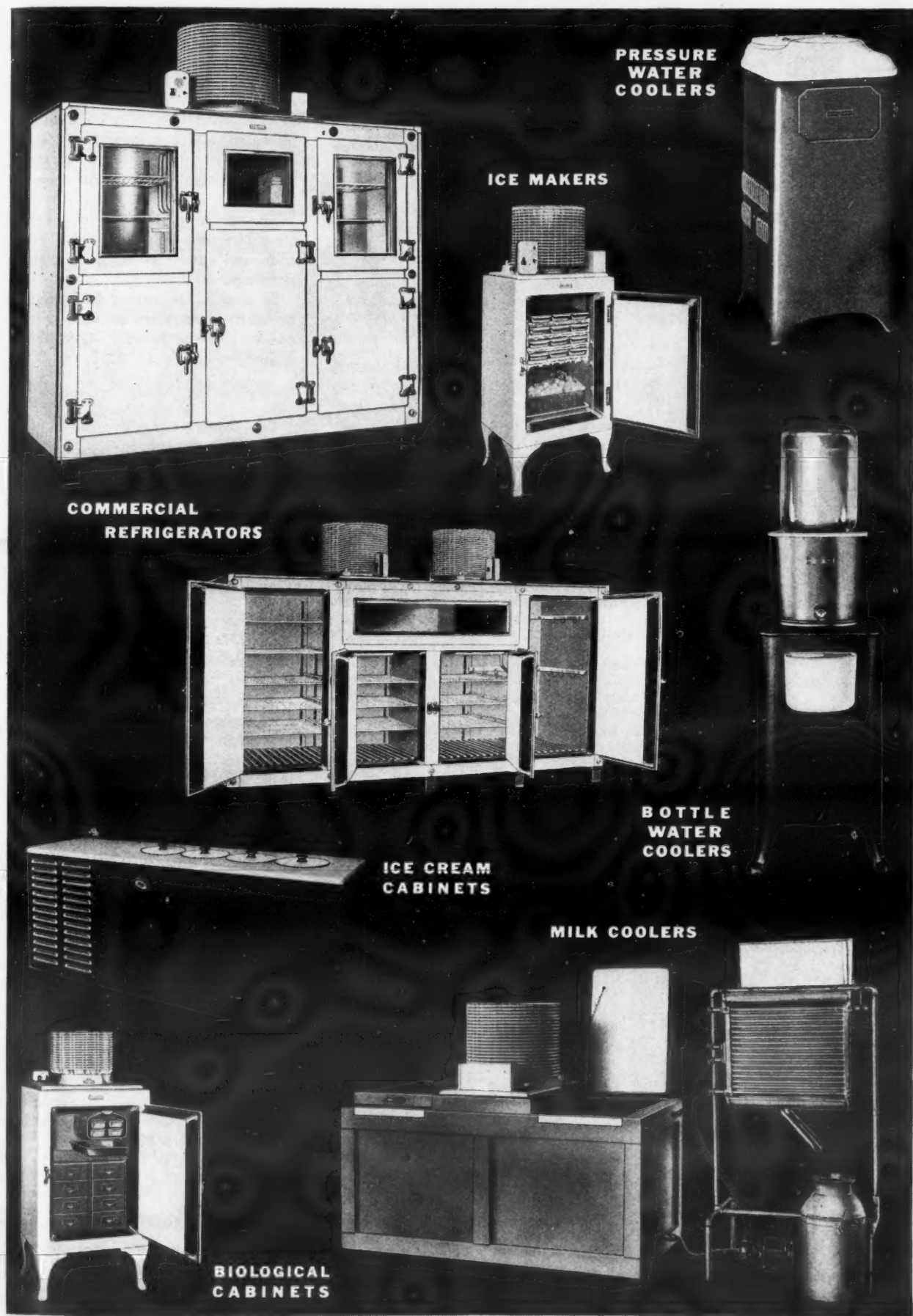
You should write to-day for our dealer proposition. We have a line of refrigerating machines for commercial use that will round out your business and make you a lot of money.

THE CARBONDALE MACHINE CO.

MAIN OFFICE, CARBONDALE, PA.

Address inquiries to The Carbondale Machine Co., Excelsior Division, South Norwalk, Conn.

The General Electric Commercial Line *3* **EARNED** *this* **YEAR GUARANTEE**



TYPICAL MODELS OF THE LINE ARE ILLUSTRATED

NOW a broad 3-Year Guarantee—unmatched in Commercial Refrigeration—gives the General Electric line still stronger sales appeal. This unparalleled warranty definitely protects owners from upkeep cost for three full years.

With brilliant performance records in every field General Electric Commercial Refrigerators and Water Coolers have *earned* their right to this 3-Year Guarantee—the most powerful sales factor in the commercial field today.

And that is only one great General Electric selling point. There is also the famous Monitor Top, and the similar water cooler unit—hermetically sealed in steel—self-oiled—lastingly quiet—safe from dirt, moisture and tinkering. There are other advancements by the score—compact reach-in cabinets, each efficiently teamed with its refrigerating unit—the self-defrosting cycle—the pre-cooling feature in pressure coolers are just a few of these.

Big substantial facts like that, including General Electric prestige and performance, are driving sales records still higher. And because the ordinary service requirements simply do not exist, every General Electric dealer can realize unusual and *permanent* profits in the commercial market.



General Electric Co., Electric Refrigeration Department, Section DF 33, Hanna Bldg., 1400 Euclid Ave., Cleveland, Ohio

Good News about the General Electric Domestic Line—Main Section Page 3

GENERAL ELECTRIC COMMERCIAL REFRIGERATION

COMMERCIAL, DOMESTIC, AND APARTMENT HOUSE REFRIGERATORS, ELECTRIC WATER COOLERS AND MILK COOLERS

Join us in the General Electric Program, broadcast every Saturday evening on a nation-wide N. B. C. network

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The Business Newspaper of the Refrigeration Industry

Published by

BUSINESS NEWS PUBLISHING CO.

550 Macabees Building, Woodward Ave. and Putnam St.
Detroit, Michigan. Telephones: Columbia 4242-4243-4244

Subscription Rates:

United States and Possessions: \$2.00 per year;
three years for \$5.00

(Refrigerated Food Section only, \$1.00 per year).

All other Countries: \$2.25 per year; two years for \$4.00

Advertising Rates on Request

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Vol. 5, No. 15, Serial No. 117, Part 2, March 25, 1931

Selling the User

SIGNIFICANT to both the refrigeration and the food industries is the remarkable rise in the number of installations of commercial electric refrigeration equipment which have been made in the last two or three years.

In some cities unusually high saturation figures for the commercial market have been reported. Commercial managers of three leading Detroit refrigeration sales organizations, for instance, agree substantially that the Detroit commercial market is almost 80 per cent saturated.

Reports from other big cities indicate that in many places more than half of the known prospects have purchased electric refrigeration within the last few years. A survey of food stores in Middletown, Ohio, reported in the last issue of *ELECTRIC REFRIGERATION NEWS*, revealed but a few scattered restaurants and meat markets which had inadequate refrigeration equipment.

Paradoxically, the same commercial sales managers who report such satisfactory progress among the food merchants of their territories also maintain that the commercial market has been barely scratched. And there is considerable evidence to support their statements obtainable in almost any food shop.

Return Visits

Salesmen who have succeeded in equipping hospitals with water coolers are now going back to sell these places biological cabinets and big storage cabinets for their dietetic kitchens.

Meat markets which installed heavy-duty compressors to refrigerate their walk-in coolers have been so pleased with the results that they now are looking into the possibilities of adding more display cases to be cooled by this economical method, and are thinking about electrically refrigerated window displays.

Grocery storekeepers in some places have become intrigued with the idea of adding quick-frozen meat lines to their vegetables and canned goods, and are weighing the considerations for and against low temperature equipment.

Even drug stores and confectioneries, which have—comparatively speaking—widely adopted the use of electric refrigeration for their soda fountains in recent years, are becoming interested in delicatessen cabinets, and in display cases for salads and desserts.

For the salesman of commercial refrigeration equipment, this expansion of a supposedly well-invaded market opens up a wider and wider potential field of activity during the coming months.

Easy Entree

Just as the man who has sold an electric refrigerator to a housewife has a comparatively easy entree into that home when he comes around with a radio, an oil burner, or a washing machine to sell, so the man who has saved a food merchant money by equipping his store with electric refrigeration will find this man a rather ready listener when he brings him another idea in economical and efficient food preservation.

For the food merchant, the increasing application of the principles of electric refrigeration to his needs

means more economical operating costs and new opportunities for utilizing modern merchandising methods in his business.

He has already had demonstrated to him how much waste because of food spoilage is saved by means of electric refrigeration, and how much cheaper the latter is over older methods. He has already witnessed the results obtained from placing his products on display in easily accessible, properly cooled cases.

He is becoming aware, not only of keen competition within his own sphere for the customer's dollar, but of the inroads of other classes of food merchants into his business.

It is becoming apparent to him that rigid lines drawn in the past between the various types of food stores are being broken down, and he is coming to the conclusion that the addition of other food lines might help him take advantage of the new situation.

He is, therefore, in the mood to study ways and means of adding to his facilities for merchandising more and different kinds of foods, and of keeping these foods well preserved.

Influence of Housewives

Still another significant factor in the progress of commercial refrigeration is the fact that 3,000,000 American homes now have electric refrigeration, and that industry figures indicate another million will buy electric refrigerators this year.

These housewives, having been sold on the necessity for the proper refrigeration in their homes of the food they serve to their families, may demand that the shops from which they buy this food be adequately equipped for food preservation.

Having become aware of the temperatures at which foodstuffs should be kept prior to consumption, they may inquire into the temperatures at which these food articles have been kept before arriving at their kitchens.

Progressive food merchants who do not have proper refrigeration equipment, and even those who have some electric refrigeration, are going to realize the need for demonstrating to their customers that all of their perishable foods are kept at the correct temperatures. Many modern food merchants are now hanging thermometers in conspicuous places in their display cases.

Cumulative Education

The cumulative effect of previous and present public education should influence considerably the ideas of consumers and retailers on food preservation.

Commercial refrigeration salesmen can capitalize on these educational programs by introducing electric refrigeration into new stores, and by going back to those they have already sold for repeat orders and replacements with newer and more efficient equipment.

Retailers of perishable foods who buy more adequate refrigeration can realize benefits through savings in operating costs, increased sales volume effected by the addition of new lines, and good will gained by emphasis on the improved service they are giving their customers.

GLEANINGS FROM RECENT PERIODICALS

"Quick-frozen foods promise within the next decade to work profound changes in food habits, living standards and health of the American people. Possibly within five years something approaching national distribution will be effected. With erection of refrigerating plants through agricultural sections bringing about elimination of waste and spoilage, and more even trend of supply and demand through all-year distribution, food, as to supply and price, will have been stabilized. "Before frozen foods can be bought on any considerable scale, it will be necessary to build up a colossal system of distribution and storage. Not only does it involve building of great refrigerating plants and warehouses, but it calls for the installation of expensive facilities in jobbers' warehouses, in retail stores, and even in homes. The grocer who sells frozen products must keep them frozen, not merely chilled. He must, moreover, know technique of handling frozen foods. Then, too, the housewife must be educated to proper use and handling of a product new to her. Anything approaching national distribution of frozen products would be almost impossible of achievement in anything short of five years."—Wainwright Evans in *World's Work*, March.

An Editor on Wheels

Stories of Interesting PLACES in the Refrigeration Industry

By GEORGE F. TAUBENECK

St. Louis, Mo.

St. Louis is a conglomerate. It has a large German population. It has a remnant of French blood—descendants of the early founders who settled there long before the Louisiana purchase made it American soil.

The West is there—breezy, hearty, friendly open-handed men with seven-league strides. Occasionally an Easterner can be spotted, appearing (and possibly feeling) as out-of-step as a frock coat at a baseball game.

Essentially it is a northern city. Its tempo is almost as fast and its rhythm as staccato as that of Chicago. Many sections of it look like chunks lifted bodily out of Chicago and transplanted on Missouri soil.

Yet there is a strong tang of the Old South in St. Louis, and a large number of citizens with Southern antecedents and accents.

"You-all," and "honey," and "daown heah" are common locutions. Even the inhabitants of northern extraction have adopted and adapted the musical word-corruptions of the plantations.

Negroes, of course, are present in multitudes.

One is told that when railroads wish to entice excursionists from "up Nawth" to St. Louis, the excursion posters list among the extra special attractions: "See 10,000 negroes, colored mammys, pickaninnies—thousands of them."

Industries of many and varied kinds are to be found.

Shoes, hats, and orchids are produced in large quantities. In a by-gone day beer was a leading article of manufacture.

Breweries, some of them large and ornate, still dot the city.

Architecturally, the city partakes of both hemispheres and many periods.

Buildings run a gamut of models through American colonial, Byzantine, Gothic, Georgian, Wall Street, Florentine, early Western frontier, and late Hollywood.

On one remarkable corner in the heart of the business district is a Parisian theatre, a Chicago hotel, a Philadelphia warehouse, and an old Boston "spa."

St. Louis is the meeting place of the Old World and the New, the South and the North, the middle and far West, the late Seventeenth Century and the early Twentieth.

It is a city which is proud of its historic past, and yet lives intensively in and for its active present.

In its public-spiritedness and local partisanship it is almost home-townish. Few athletic teams get the enthusiastic support accorded Branch Rickey's "Cardinals."

The other half of the Lindbergh "We" partnership, as everybody knows, was a monoplane named "Spirit of St. Louis." Booster St. Louisans maintain that the name brought "Lindy" luck.

Mark Twain has celebrated the time when St. Louis was a great inland port. In those days hundreds of sidewheelers plied the Mississippi laden with materials and goods which now are more likely to travel overland on steel rails.

The Mississippi still rolls past. Shorn of much of its former glory, it is even today a source of civic pride.

Visitors are sent to gaze upon it before seeing anything else. Next on the preferred list of civic sights are Shaw's botanical gardens, and the zoo. Also recommended to all "furriners" is the collection of Lindbergh's trophies.

Keokuk, Iowa

Overlooking the majestic Mississippi, Keokuk rides high on a bluff, which rises sharply from the water's edge to a point 90 feet above the Father of Waters and 575 feet above sea level.

It has a Main Street, which begins at the river bank, climbs over the top of the bluff, and disappears into forests of tall corn (in season).

Stationed alongside the ending portion of Keokuk's Main Street is an intermittent row of silent, gloomy, sepulchral, brick buildings. Generally these boxlike structures, relics of earlier times when the Mississippi was a glamorous mainstem of traffic,

are conceded to be abandoned. But there is some talk of ghosts, and of eerie activities, and strange lights.

Main street is much like Main street anywhere in the middle West. Mercantile establishments string along its sides in haphazard succession, and business progresses as usual. In its approximate center (both in latitude and longitude) is an equestrian statue.

One particular advantage of Keokuk's chief artery is its commanding height. The remainder of the town dips away in undulations not altogether gentle.

Some stately castle-on-the-Rhine mansions are located on a point of the Keokuk bluff, at the northernmost edge of town. That point is a romantic spot. On it one can conjure up imaginative pictures of Indian sentinels, lairs of river pirates, lover's leaps, and all sorts of melodramatic occurrences.

Said to be the largest in the world, the Keokuk dam checks the flow of the Mississippi for more than 25 miles. It is 53 feet high. The water drop is about 40 feet—a huge volume of water falls a comparatively short distance to turn mammoth turbines, which revolve at the slow rate of 57½ R. P. M.

The connected power house is one-sixth of a mile long, half a city block wide, and almost as tall as a 15-story skyscraper.

In it is a fascinating collection of generators, transformers, and switches—all gigantic in size. One of the transformers weighs 22 tons.

Every wired home in the United States could be furnished with light by this amazing power plant, one is told.

Adjoining the dam is a lock for transferring ships from the "before" level to the "after" level of the river. It is larger than any of the locks in the Panama canal.

There is also a United States drydock, on which may be seen barges, stern-wheelers, and scows in various stages of repair.

Among the industries which are located in this town of 16,000 are factories which make metal castings, batteries, barrels, shoes, cans, boxes, brooms, candies, cement mixers, cigars, cranes, curry-combs, furniture, glucose, hardware, hog jewelry (nose-rings and suchlike), hoists, patent medicines, overalls, blasting powder, shirts, pearl stucco, canned foods, tractors, and electric refrigerators.

Soy beans rival corn among Keokuk agricultural products. Winter wheat, cucumbers, tomatoes, melons, grapes, strawberries, apples, peaches, and pears are also grown. Dairy farming and poultry raising are increasing in importance.

Across the river is Nauvoo, Illinois, whence Brigham Young led the Mormon pilgrimage to Utah, following the death of Joseph Smith.

The bodies of both Joseph and Hiram Smith lie there. Members of the Reorganized Mormon church have made Nauvoo something of a Mecca for all devotees. Said to be the first of America's occasional communistic communities, the Icarian Colony was once located in Nauvoo.

Fort Madison, Iowa

Built on a narrow flood plain between the Mississippi and a high point of land, Fort Madison is shaped something like a big index finger.

Two handsome views are afforded. One is the riverbank, alongside of which courses a business street.

On the edge of the bank, for a short distance, is a pleasant bit of greensward, decorated with a cannon and (in season) lovers' benches.

Handsome View No. 2 may be had from the heights of the bluff which bounds one side of the town. From this quiet point of vantage one can see for miles and miles over the Iowa and Illinois plains.

Two widely separated groups of palatial residences have been built upon this eminence. One group contains homes built from the proceeds of the manufacturing of Shaeffer pens and pencils—Fort Madison's leading industry.

Like many Great Plains towns of its size (under 15,000), Fort Madison is populated with friendly, easy-going people. It would be a great place to retire and write a book.

A PAGE FOR HOME SERVICE WOMEN

Home Economist Prepares Recipes For Gelatin Desserts

By Edwina Nolan

Home Service Director, General Electric Refrigeration Department

A NUMBER of delightful recipes that any housewife, who is the owner of an electric refrigerator, will truly appreciate, have been sent to me by Miss Alice Robertson, director of Home Service Institute of the George Belsey Co., Ltd., General Electric refrigerator distributors in Los Angeles.

Here are the recipes:

Most recipes for dessert to be frozen in the electric refrigerator require cooking previous to freezing. But it is very easy to make good desserts without any cooking whatever.

Frozen Egg-Nog

- 4 egg yolks
- 1 cup rich milk
- $\frac{3}{4}$ cup powdered sugar
- $1\frac{1}{2}$ teaspoons gelatin
- 2 tablespoons cold water

Beat egg yolks until light, add powdered sugar and beat well. Soak the gelatin in cold water and dissolve over hot water. Cool. Add the milk slowly to the egg yolk mixture, beating with a rotary egg beater until it is like thin custard. Add the cooled gelatin and place in freezing tray until thickened.

2 teaspoons rum extract (Garrett's)
1 cup cream to whip
2 egg whites

Sprinkle with nutmeg when serving

Whip the cream and fold into custard mixture. Whip the egg whites stiff but not dry and add to the first mixture. Freeze in tray of electric refrigerator. Beat once or twice during the first hour of freezing. Freezing time 3 to 4 hours. Service for eight.

Orange Fluff

- $\frac{3}{4}$ cup of sugar
- $\frac{3}{4}$ cup water

Boil sugar and water together until it will spin a thread (238 degrees). Take from the heat and add the grated rind of two oranges and $\frac{1}{4}$ cup orange juice strained. Soak $\frac{1}{2}$ teaspoon gelatin in 1 tablespoon of cold water and add to hot syrup. Cover and let stand until thoroughly chilled.

Place 1 cup of strained orange juice in the bottom of freezing tray and place in freezing compartment to partially freeze. Whip 1 pint of cream and slowly add to syrup mixture. Remove tray with orange juice and very carefully pile the cream and syrup mixture on top of the orange juice. Return to freezing compartment and freeze without stirring about 4 hours. Slice and serve on small plates. Service for eight.

Orange-Lemon Refrigerator Pie

The use of some sweet food at the end of a meal gives a certain satisfaction to the appetite which seems to be lacking if desserts are omitted. The "Refrigerator Pie" is coming into prominence.

Soak 1 tablespoon gelatin in $\frac{1}{4}$ cup cold water. Beat together four egg yolks, $\frac{1}{2}$ cup sugar, juice and rind of one orange and one lemon; beat in top of double boiler until cooked to soft custard stage. Add soaked gelatin. Beat the four egg whites with $\frac{1}{2}$ cup sugar and fold into custard mixture and pour into baked pie shell and let cool in your electric refrigerator. Serve with whipped cream if desired. Service for five.

Putting Maple in the Menu

By Mrs. Beulah Canterbury

SUGAR-WATER buckets are appearing on the trunks of the sugar maples ready to catch the sweet rich sap that, in two or three weeks, will appear in the markets in the form of maple syrup, maple sugar cakes and granulated maple sugar.

Maple sugar makers anticipate that one of the richest "runs" in history is pushing up through the tall trees, due to the extended drought which produced sap exceptionally rich in sugar.

It is a wise hostess and housewife who takes advantage of the "first run" from the maple trees and plans her menus to include maple ice, maple pudding or maple ice box cookies.

Here are a few maple recipes that will add a touch of variety to the bridge tea, dinner or club luncheon:

Maple Mousse

- 1 cup maple syrup
- 4 eggs beaten together
- 1 pt. whipped cream

Beat eggs, add syrup and cook together in double boiler until rather thick. Cool and add to beaten cream. Pour into electric refrigerator tray and freeze without stirring for about 3 hours. Serve with sponge or angel food cake.

Golden Maple Parfait

- $1\frac{1}{2}$ cup maple syrup
- 6 egg yolks
- 1 pt. whipping cream

Heat syrup in double boiler. Pour into it slowly the beaten yolks. Stir together over boiling water 5 minutes. Cool and add to whipped cream. Pour into refrigerator trays and let stand 3 hours. Serve in parfait glasses with chopped browned almonds sprinkled over the top. Serve this parfait as dessert for dinner with maple ice box cookies.

Maple Ice-Box Cookies

- 2 cups grated maple sugar
- $3\frac{3}{4}$ cups flour
- $\frac{1}{2}$ tablespoon soda
- $\frac{1}{2}$ cup butter
- 4 eggs beaten separately
- $\frac{1}{2}$ tablespoon cream tartar

Cream butter and maple syrup. Add beaten yolks. Sift cream of tartar and soda into flour and add. Lastly, fold in egg whites beaten thoroughly. Mix and form into roll about 2 inches in diameter. Place in electric refrigerator and let stand over night. In the morning, slice in thin rounds and bake.

Maple Frosting

- 1 cup maple sugar
- 1 cup boiling water
- 1 egg white
- $\frac{1}{2}$ teaspoon cream of tartar

Boil sugar, water and cream of tartar until thread is formed. Pour on to beaten white and continue beating until of consistency to spread.

Maple Walnut Tapioca

- 1 pint milk
- 2 egg yolks
- $\frac{3}{4}$ cup maple syrup
- 2 tablespoons tapioca
- pinch salt
- 1 cupful walnut meats

Heat milk in double boiler, stir in the tapioca and cook 15 minutes. Add well beaten yolks of eggs and salt. Stir for 3 minutes and then cool. Beat the maple syrup into the tapioca mixture and then add nut meats broken into small pieces. Chill in electric refrigerator and serve in glasses, with whipped cream on top, garnished with whole nut meats.

Maple Sauce for Ice Cream or Puddings

- 2 egg yolks
- $\frac{1}{2}$ cup maple syrup
- $\frac{1}{2}$ cup beaten cream
- few grains salt

Beat yolks till thick; add syrup and cook until it thickens. Add beaten cream and salt. Chill.

Maple Nut Sandwiches

- 1 cup grated maple sugar
 - $\frac{1}{4}$ cup butter
 - $\frac{1}{2}$ cup chopped black walnut meats
- Cream butter and add sugar gradually and mix until thoroughly blended. Add nut meats. Spread on rounds of thinly sliced whole wheat bread.

Maple Nut Cake

- $\frac{1}{2}$ cup butter
- 1 egg
- $\frac{1}{2}$ cup maple syrup
- $\frac{1}{4}$ teaspoon salt
- $\frac{3}{4}$ cup granulated sugar
- 2 cups flour
- 3 teaspoons baking powder
- $\frac{3}{4}$ cup milk
- 2 tablespoons finely chopped nuts

Cream shortening and sugar. Add beaten yolk of egg, then syrup, then milk and flour (into which baking powder has been sifted) alternately. Mix thoroughly, add nut meats and fold in beaten egg white. Bake in two layers and put together with maple frosting.

Maple Baked Custard

- 4 eggs
- $\frac{1}{2}$ cup maple syrup
- 3 cups milk
- pinch salt

Beat eggs till foamy, add pinch of salt. Then beat the syrup into eggs and add the milk. Beat slowly until well mixed. Put into cups and set in pan of hot water in oven and bake till firm. Chill in electric refrigerator and serve with topping of whipped cream.

Maple Walnut Jello

Dissolve a package of orange jello in half pint boiling water. Add $\frac{1}{2}$ pint maple syrup. When nearly cold, add one cup of walnut meats broken into pieces. Mold and chill. Serve with maple sauce or whipped cream.

MRS. MCGLINN ADVANCED BY KELVINATOR IN EAST

Philadelphia—Mrs. Mary Aida McGlinn has been advanced to the position of director of the home economics department of the Kelvinator branch here, succeeding Miss Gertrude Janssen, who was recently transferred to the home office at Detroit.

Prior to joining Kelvinator here as assistant to Miss Janssen, Mrs. McGlinn spent some time on the stage. She also operated a tea room in this city but was forced to give up this venture on account of ill health.

CANDY SALES

Washington—Candy sales in January amounted to \$21,948,225, according to the Foodstuffs Division of the U. S. Department of Commerce. This is 8.6 per cent less than the January, 1930, sales of \$24,019,884.

The December sales are usually much higher than the January sales in the candy business, this division further states. This decline was not as noticeable in January, 1931, as in other recent years.

For the industry as a whole, the decline from December sales amounted to 23.4 per cent, as compared to a decline of 27.1 per cent in January of 1930, and 25.9 per cent in January, 1929.

In January of this year sales of manufacturing wholesalers amounted to \$17,628,865, a decline of 7.1 per cent from the \$18,994,568 total in January of 1930.

Cherries, Apricots Make Delightful Frozen Delicacies

By Mrs. P. K. Dunning

Home Service Director, The Society for Electrical Development

CHERRY and apricot desserts can be easily prepared in an electric refrigerator. Here are four recipes, three using cherries and one apricots:

Frozen Apricot Whip

- 1 cup cooked dried apricot pulp
- 1 egg white
- $\frac{1}{4}$ cup sugar
- $\frac{1}{2}$ cup cream
- $\frac{1}{4}$ cup chopped pecans (if desired)

Rub the cooked apricots through a coarse sieve. Beat the egg white stiff and fold in the apricot pulp. Add the sugar and the pecans if they are to be used. Beat the cream stiff and fold into the apricot mixture.

Mix well and pour into tray of electric refrigerator. Freeze for at least four hours, though longer freezing does not harm the mixture. Serve with a custard sauce made of the egg yolk, one-half cup of milk, 2 tablespoons of sugar, a little salt and vanilla extract.

Cherry Mousse

- 1 cup whipping cream
- 1 cup pitted cherries
- $\frac{1}{2}$ cup sugar
- 2 egg whites
- Speck of salt
- $\frac{3}{4}$ cup cherry juice

Pit and chop 1 cup of cherries. Drain thoroughly and place in electric refrigerator to chill. Boil together the sugar

and cherry juice until two drops run together on the spoon.

Pour slowly over the stiffly beaten egg whites, stirring constantly. Chill until of the consistency of whipped cream. Whip the cream and combine with the first mixture. Fold in the cherries and add the salt. Pour into freezing tray of electric refrigerator.

Jellied Cherry Salad

Drain and stone a can of white cherries and chill the fruit in electric refrigerator. Prepare an aspic of one cup grenadine, one-half cup cherry juice, $\frac{1}{4}$ cup each lemon and orange juice.

Bring to boiling point and add $1\frac{1}{2}$ tablespoons of gelatin which has been softened by soaking in $\frac{1}{4}$ cup cold water for five minutes. Stir until thoroughly dissolved and chill.

When beginning to thicken add the cherries and pour into individual moulds or into one large mould and place in electric refrigerator to become firm. Serve on lettuce leaves with a dressing composed of $1\frac{1}{3}$ whipped cream and $2\frac{2}{3}$ mayonnaise or boiled dressing.

Cherry Cocktail

Mix together stoned black and stoned white cherries. Add a quantity of apple balls cut out with a French potato ball cutter or with $\frac{1}{2}$ teaspoon of your measuring spoon set.

Sprinkle with lemon juice and place in electric refrigerator to chill thoroughly.

Opening the eyes of Ice Cream Retailers



THE eyes of ice cream retailers are being opened to the loss they have been suffering through shrinkage of ice cream. They have been shown and have become convinced that there is a shrinkage of from 20% to 40%, which means that out of every five-gallon can they buy, they actually sell only 12 to 16 quarts. They are beginning to see that the only profitable method of merchandising ice cream is to make and package it themselves and that by so doing they not only make a greater margin of profit but increase their sales by virtue of a better quality of ice cream.

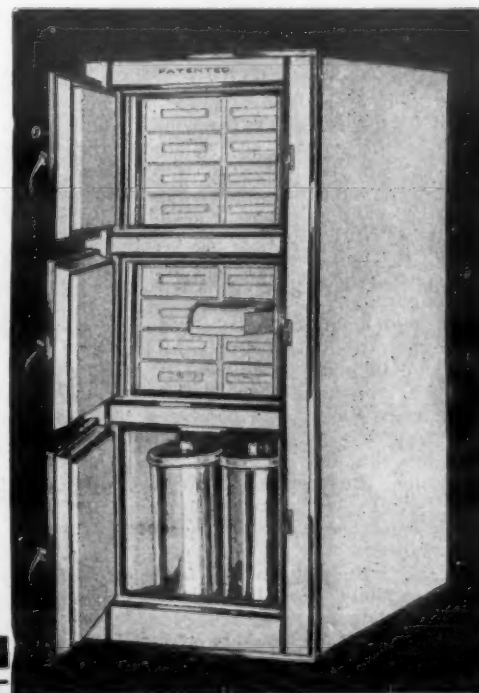
The market for ice cream making and dispensing equipment is, therefore, growing by leaps and bounds.

UNIVERSAL

is the most complete line of such equipment on the market. It has been developed from a thorough knowledge and practical experience in ice cream making and retailing. Advertising of this line is bringing thousands of inquiries from all over the world.

A few choice territories are open

Write for
Descriptive
Literature
and
Dealer
Proposition



Shown at the top is the UNIVERSAL 5-gallon Freezer in combination with UNIVERSAL Horizontal Cabinet with a capacity for 20 gallons of ice cream mix and 70 gallons of ice cream.

Above, at left, is a patented combination of UNIVERSAL 5-gallon Freezer and Vertical Cabinet with capacity for 20 gallons of bulk ice cream and 30 gallons in selective packages.

At right is shown UNIVERSAL Vertical Cabinet for ice cream or other frozen foods.

UNIVERSAL FREEZER CORP.
1113 PENN AVE. PITTSBURGH, PA.

DESIGN, INSULATION OF DISPLAY CASES

Development of Display Case Design, Construction Traced

By L. K. Wright
Member A. S. R. E., N. A. P. R. E.

RECENT attention devoted to display cases has resulted in better design and maintenance of lower temperatures, conducive of a more tempting display of edibles.

The simplest case encountered is one constructed of single glass and provided with a hinged or sliding door on the service side. It is usually mounted on a marble or glass slab and the entire case is in no way insulated unless the wooden service door be construed as such.

Sometimes, due to being already installed, insistence is made to provide such a case with coils, even though it may be pointed out that due to the case structure of single glass, total absence of insulation, and the location of the coil, very little temperature difference can be expected in other than trays or materials in direct contact with the coil.

Where the installation of a coil is contemplated in this simple type of case, it is well to examine it carefully, with view to removing one wall or end section so that the coil may be placed in position. The coil used for such a case may be of the single flat return bend type and a flat surface should be presented to rest trays upon.

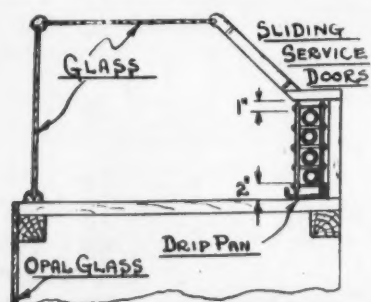


Fig. 1. Coil in Side Pocket of Display Case

By the use of flat strips tack welded to the under side of the coil, an unbroken flat surface is presented, whereas where the straps are used in pairs and bolted together a ridge results which spoils the appearance of the display in that those pans resting on the straps are tilted or slanted.

The coil is placed in a drip pan of such size that it catches all the moisture falling from the coil, with the coil and drip pan placed directly on the uninsulated bottom of the case.

In order to prevent condensation on the under side of the glass or marble slab it is best to line the bottom with a layer of insulation. This particular type of installation is used where the case is of no great height, but where sufficient room is had it is best to install the coil at an angle.

The coil is best constructed with either legs or some support raising the service side of the coil about 3 in. When the trays are placed on this tilted coil a much better display is had, in that it is in the direct line of vision, and sufficient room is had so that it is an easy matter to sweep out any scraps which may fall into the drip pan.

Development of "Well" Design

One of the first steps toward furnishing cases intended to keep foodstuffs cool was shown in the so-called "well" design, consisting of essentially the same structure as the previous display case, with the exception that the marble or glass slab was replaced with a pan or well, to be filled with crushed ice. Some of the ice pockets were insulated with ground or sheet cork, sawdust and hairfelt, while others were as entirely devoid of insulation as the old type.

Where appreciable depth is presented by the well, it is best to place the coil so that its top surface is level with what would be the normal slab surface; the space between the coil and the bottom of the well being filled with insulation. If desired, and the space permits, the coil may be tilted in the case.

The drip pan used under the coil in this particular type should be equipped with edges of from 3/4 in. to 1 1/2 in. in width, which may be soldered to the existing well. This will maintain the insulation in a dry condition.

The next advance in case construction was in providing a side pocket, separated from the case proper by a coarse wire screen so that ice could be packed in the channel thus provided. Where coils were used to refrigerate the case the wire screens are removed to secure better circulation.

A flat single wound coil, depicted in an end sectional view in Fig. 1, may be used to refrigerate such a case. This particular type of case is still in demand, although the tendency has been to provide a somewhat larger and

broader coil space, together with an insulated bottom and service side.

Where the pocket is of larger size, a better temperature may be held, due to the increased circulation of air and in that more pipe or tank surface may be used.

Coils provided with cooling fins, cast "radiator" sections, galvanized pipe or brine tanks may be used to cool cases

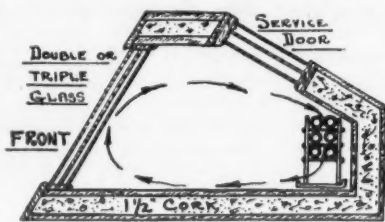


Fig. 2. Air Flow in Insulated Display Case

provided with side pockets. One of the easiest and most efficient methods is to employ 3/4 or 1 in. pipe bent into "hairpin" coils. The pipe coils are easy to fabricate and ship. If galvanized after complete assembly a cooling unit of pleasing and lasting appearance is secured.

The pipe coil has the added advantage in that it can be quickly made up and installed in cases of any length or size. Where cases exceed 14 ft. in length it is best to make use of several coils, unless shipping and facilities for moving the coil in place are such that one long coil may be considered. Long coils are rather unwieldy and extreme care must be exercised in setting them in place so that the case is not damaged. It is generally desirable to have the inlet and outlet pipes at one end of the display case. Where the case is short a single coil may be utilized, but where the individual coil exceeds 14 ft., it is best to make use of an additional coil. These coil sections are provided with flanges located at the top of the coil so that they are easily connected.

The straps or legs of the coils should be spaced from 3 to 5 ft. apart, and about 1 ft. from the ends. The bottom of the legs should be smooth so that the drip pan or cabinet will not be cut in pushing it into position. The legs should be of such height that the bottom pipes of the coil are raised about 2 in. above the drip pan, so that a brush can be used to keep the space sanitary and free from scraps.

Should it be desirable to have the inlet and outlet pipes of the coil at opposite ends of the case, the return pipe can be brought through the center of the coil, holding it with strap iron, tack-welded in place.

Multiple glass top cases may use coils in side pockets.

It is a mistake to attempt to determine the heat load of the uninsulated cases, as the variance may be so great as to render any estimates void. Where double or triple glass is used, together

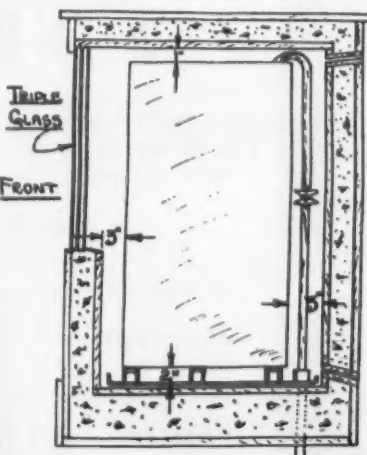


Fig. 3. Brine Tank Installation

with insulation of 1 1/2 in. thickness or more, the heat load can be estimated. An end sectional view of such a case is shown in Fig. 2, the arrows depicting the air flow.

Table 1—Heat Load of Top Cases, with Low Side Coils
(In B. t. u. per 24 hours)
Includes average usage on cases having 1 1/2 in. of corkboard.

Length of Case, in Ft.	Double Glass			Triple Glass		
	40	50	60	40	50	60
6.....	16,800	21,000	25,200	13,700	17,100	20,600
8.....	22,100	27,600	33,100	18,000	22,400	26,900
10.....	27,400	34,200	41,000	22,200	27,700	33,300
12.....	32,700	40,800	49,000	26,400	33,000	40,000
14.....	38,000	47,400	56,900	30,700	38,300	46,000
16.....	43,200	54,000	64,800	34,900	43,600	52,400

It should be remembered that in all cases where the coils or cooling elements are installed in a relatively low position, that a relatively uniform temperature will not result in all parts of the case. The temperature will be uniform only to the height of the cooling element. A study of the air circuits shown in Fig. 2 will disclose the reason for the upper portion of the case having a considerably higher temperature than the portions of the case where air circulation occurs.

A very effective case is that equipped with the cooling coils just under the crown of the case. The warm air rises, impinges on the coil or cooling element, and falls by virtue of greater gravity to the bottom of the case, and through the maintenance of this circulation the entire case is cooled.

This case, assumed to have an insulation of 3 in. of corkboard, and equipped with triple sealed glass, will have a fairly constant heat load. The heat load of such a case, including the average usage, but not electric or display lights, is given in Table 2.

Table 2—Heat Load of Top Cases, with Top Coils, Triple Glass
(In B. t. u. per 24 hours)

Length of Case, in Ft.	Temperature Difference, Degrees F.		
	40	50	60
6.....	10,800	13,500	16,200
8.....	14,200	17,700	21,300
10.....	17,600	21,900	26,300
12.....	20,900	26,100	31,300
14.....	24,300	30,300	36,400
16.....	27,600	34,500	41,400

Another type of display case, which is capable of acting in the dual capacity

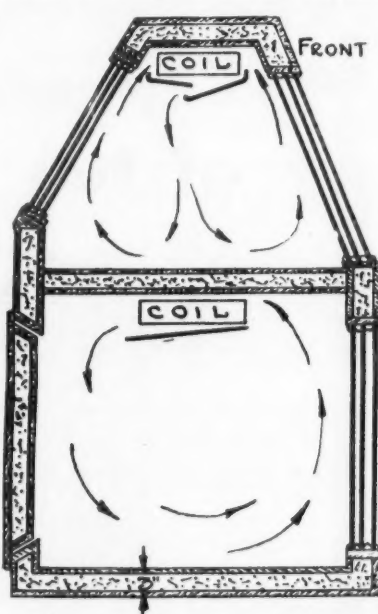


Fig. 4. High Counter with Storage Space

of storage refrigerator and display counter, is the counter case. Refrigeration is furnished by coils or tanks located in the end sections; and with long cases, at distances about 6 ft. apart. Inasmuch as there is no desire to display the coils or brine tanks, the ends or refrigerating sections are provided with solid cork walls and usually finished with enamelled or opal glass panels.

Assuming the case to be insulated with from 2 to 3 in. of sheet cork; and that triple glass is used so that fogging will not occur to hinder the display, and also that the heat leakage will be kept at a low value. Table 3 will approximate the heat loads. The figures include average usage, but do not consider displays or lights.

Table 3—Heat Loads of Vertically Cooled Counter and Display Cases
(In B. t. u. per 24 hours)

Length of Case, in Ft.	2" Corkboard			3" Corkboard		
	40	50	60	40	50	60
2 { 6.....	17,800	22,300	26,700	15,800	19,800	23,800
coils { 8.....	23,000	28,500	34,500	20,600	25,700	30,800
3 { 10.....	28,200	35,300	42,300	25,300	31,600	37,900
coils { 12.....	33,400	41,800	50,100	30,000	37,500	45,000
4 { 14.....	38,600	48,200	58,000	34,700	43,400	52,100
coils { 16.....	43,800	54,800	65,800	39,500	49,300	59,200

These cases may be refrigerated by cooling surfaces chilled either by direct expansion or brine. If coils alone are used they may be direct expansion units or, should a supply of chilled brine be

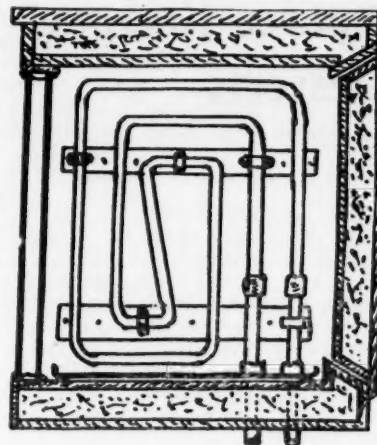


Fig. 5. Cheese Storage Case

available, the coils may be cooled by brine circulation.

Where direct expansion is used it will be best to submerge the cooling coils in brine tanks. Two types of coils are

of insulation, but the glass in this instance need be only of single pane construction, since the object of it is merely to act as a protective medium rather than in any insulating capacity. It is understood that very little temperature difference will be had in the glass section of the case, since the ice and refrigerating coils are located in the lower section of the case.

Double Glass Used in Cheese Cases

While cheese as a rule does not require low temperatures, it is best if the cases intended for cheese storage be equipped with double glass and insulation of from 2 to 3 in. of insulation so that the heat load be reduced and the non-fogging panes will present a tempting display.

For cases up to 6 ft. in length, use is made of two coils, one at each end; but where the cases exceed that length, an additional coil may be placed in the mid-section. The coils may be formed in a square or oblong shape, as shown in Fig. 5, or a flat spiral coil may be employed. The spiral coil is somewhat the harder to fabricate, unless special tools and forms are on hand. The square or oblong coil is therefore the most popular, as no forming equipment is required.

Another commodity which is best kept at a low temperature and segregated from other products, which sometimes causes tainting, is butter. Butter cases are usually constructed in the type of a high refrigerator, with the coils located in a loft, as shown in Fig. 6.

A series of doors, provided with double or triple glass so that the individual butter tubs can be viewed, are arranged at a convenient height.

Lower Compartment for Storage

The lower portion of the box is used for the storage of butter tubs, access being had by doors of solid construction. Great variance is observed in butter box sizes, and any compilation of sizes could hardly be made complete. It is best to estimate each box separately in order to secure proper results.

Window displays are difficult to keep cold, as it is usually impossible to utilize more than the single glass in the window. The heat of the steel and possibly direct sun bring extra loads on the display.

One type of display often seen in butchers' windows is the flat return bend coil, fastened to the wall, or sometimes on each end wall. There is no attempt made to insulate the window, the frosted coils giving the suggestion of cold.

Where some degree of refrigeration is desired, the window should be insulated, as shown in Fig. 7, and a coil installed at the top. The dimensions shown in the illustration referred to were taken from an actual installation, which employed brine circulation.

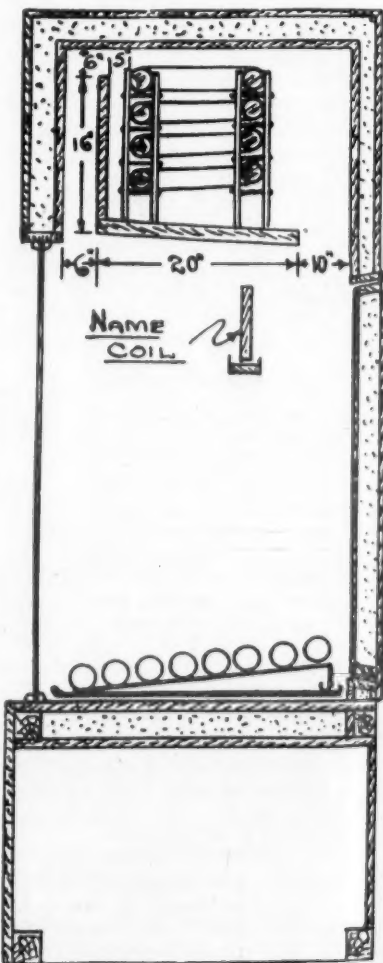


Fig. 7. Window Display

Window displays may be made effective by having a name coil placed in the center, in lieu of a painted sign. The name may be formed of 3/4 or 1/2 in. extra heavy tubing, which may be bent on a very small radius when heated. The entire coil should be galvanized to prevent rusting.

Brine is used to produce the heavy coating of frost on the display, and as the operation continues, icicles improve the appearance of the name coil.

is the high counter which affords a full display, or sometimes the lower section is separated from the display portion and used as a storage space.

Fig. 4 illustrates a high counter and

storage space combined, giving a full display. The lower portion of it is used for storage, and is separated from the display section by an insulated partition.

One of the most difficult foods to preserve is fish, as a dry refrigerator condition will cause dehydration. It is best to pack fish in or upon ice so that the fresh appearance is preserved.

A fish case provides a storage space beneath, and a display shelf, whereon the fish may be packed with ice. The case is provided with a pipe coil to maintain low temperatures, but ice must be used to pack the fish held in storage. As required, the fish are taken from the storage section and placed on the sliding shelf for display.

A fish case should have three inches

Developments in Low Temperature Equipment

Frozen Food Cases Present Many Engineering Problems

By D. E. Rutishauser
Chief Engineer, Hussman-Ligonier Co.

WHEN frozen meat cases were first discussed, there were many opinions expressed as to the possibility of developing a satisfactory low temperature case.

Some of the optimistic designers felt that the problem would be a comparatively simple one, in view of the fact that low temperatures had already been held in ice cream cabinets and similar equipment.

However, after the first cases were built and tested, a great many unforeseen problems presented themselves. Even today the answer to some of them, although apparently correct, have not been tested to such an extent that they can be termed "entirely satisfactory."

The initial designs were practically the same, or similar to, meat merchandising equipment of the past; and as the development continued along this line, it became apparent that if the old-time characteristics would be adhered to, the cost of the equipment would run excessively high.

A thorough study of the market for equipment of this type revealed the fact that the ultimate individual purchaser could not afford to pay for expensive equipment out of his earnings in handling these products.

Element of Cost

It was also pointed out, by some of the large concerns behind this movement, that the rapidity with which the new products could be brought to general use would depend entirely upon how many individual users could afford to buy equipment necessary for this purpose. The element of cost therefore became the governing factor in all designs and ideas pertaining to this work.

To build equipment capable of handling low temperatures became merely just one step in the procedure. To design and build the mechanical equipment necessary to do the actual cooling presented a problem of equal importance, upon which the question of cost made its necessary limitations.

In the early stages of tests on laboratory models, various methods of handling the defrosting condition of the low side were tried out.

High-temperature gas and electrical devices, although successful, were not relied upon to be the answer to the problem. It was evident from the tests made on these devices that the initial cost, plus the service expense, and the hazard involved in releasing such automatic equipment to the field, placed it outside of the realm of practical usage.

Fin-type coils and these automatic features, therefore, gave way to test work, using flat surfaces wherein the frost accumulation could be removed manually with a stiff brush or some sort of scraping device.

Encouraging Results

The encouraging results obtained from this type of low side brought with it the desirable feature of creating a holdover, and the smoothing out of running time cycles of compressor operation.

Flat surfaces, refrigerated in slab form, could readily be designed to accommodate the low sides of direct expansion systems.

At that time a great many refrigerating companies were doing considerable research work on expansion systems, using sulphur and methyl chloride as refrigerants. Systems for the use of ammonia already had been quite thoroughly pioneered by the old line manufacturers of ammonia machines.

The success of direct expansion systems in connection with this work fitted in perfectly with the tendency to reduce costs, as these latter systems were comparatively easy to construct on a low cost basis.

With a low cost refrigerating system available, it became a matter of design in incorporating this system into low temperature equipment in such a manner as to give the proper display and accessibility for dispensing the merchandise.

Merchandisers of the new products stressed the desirability of having a display more outstanding than anything previously used in fresh cut meats. The 45 degree angle sloping shelf came forward as being the answer to this request, fitting in perfectly with the general scheme of design.

Accompanying the unusual display feature came the desire for increasing illumination, to a point where the display of the products would immediately attract attention because of an unusual flood of light.

This was accomplished by eliminating

the "cigar-box" type of light on the outside, and substituting flood light effects on the sides and ends of the equipment.

To further keep within the cost limitations, it became desirable to make the display equipment as small as possible, and yet carry a representative exhibit of all items to be sold.

A 6-ft. length case seemed to accomplish this result, with a suitable storage compartment provided below the display. This short length case would also enable frozen meats products to be sold in stores too small for standard fresh meat equipment; and would permit the timid buyer to experiment on his customers at a minimum of expense to determine whether a proper market was available in his particular territory.

For larger stores, where increased volume would be required, the addition of a storage box embodying the same refrigerating principles would enable the user to carry sufficient stock on hand to meet his requirements and carry them over a limited number of deliveries per week from the wholesaler.

The adoption of a plan using small units of both the display and storage type of equipment has met with the approval of all those interested in the promotion of the frozen meat program.

We have found, in this low temperature work, that it is only too easy to jump at conclusions regarding performance and dependability, and have been extremely conservative in statements on equipment of this type, as our laboratory and field tests have shown that obtaining and maintaining the required temperatures is only part of the problem.

Only severe tests over a long period of time will present a true picture of the results to be obtained in years to come.

KNOWLEDGE OF FREEZING POINTS VITAL—WOOLRICH

Memphis, Tenn.—Accurate knowledge of the freezing points of foodstuffs will be of great value to the refrigeration industry, maintains W. R. Woolrich, of this city. Woolrich gives the following reasons:

(1) It will give definite knowledge of the danger point below which the materials will depreciate rapidly after thawing, if cooled by slow freezing.

(2) The actual heat extraction for cooling below freezing is only about one-half that above freezing for the same temperature drop; thus, to calculate it exactly, the freezing point should be known.

The freezing process of any liquid like the juice of a fruit or vegetable has a somewhat involved theory, says Woolrich. Whenever any salt or mineral matter is added to water it lowers the freezing point. This holds for the juices of fruits just as it holds for brines.

When freezing begins, the first ice crystals formed are nearly pure water. Once some water crystals do freeze, the remaining liquid must necessarily be more concentrated. This would in turn lower the freezing point of the remaining liquid, Woolrich points out.

In fruits or vegetables in storage, each cell is so relatively small that this effect cannot be readily felt, since the impurities do not have free movement.

The variation, therefore, in freezing temperature between starting freezing and final freezing of the fruits or vegetables is probably not great.

CANADIAN COMPANY NOW QUICK-FREEZING FISH

St. Andrews, Canada—Algonquin Sea Foods, Ltd., of this city, has recently gone into production on rapid-frozen fish fillets.

The Algonquin plant, when run at capacity, can produce 30,000 pounds of fillets daily. About 70,000 pounds of raw fish are required for this output.

The brine freezing process being used by the Algonquin company was developed by that concern in co-operation with Dr. A. G. Huntsmann and other members of the Biological Board of Canada.

Collection of the fish will be made direct from the individual fisherman by the company's own boat. Fish such as flounders, haddock and cod are now being filleted. All kinds of fish, including herrings and clams, will probably be filleted by the company in the future.

After preserving the fish in this manner, the Algonquin Sea Foods Ltd. will ship it by express to Boston, Toronto, Montreal and other points.

OLD-TIME GROCERY SELLS FROZEN MEATS

Meriden, Conn.—An old-fashioned grocery store here, which combines the basic policies of an earlier day with a keen sense of the modern public's marketing needs, is steadily boosting the sale of Swift's Identifiable Cuts in spite of winter handicaps and the industrial depression.

Fred E. Yale, proprietor of the establishment, founded 53 years ago by the late Fred L. Yale, and now known as Fred L. Yale & Son, 300 East Main St., recently took advantage of a cooking school conducted by the Meriden Record to push the Swift line.

Large advertising space was used in the local newspaper, setting forth the advantages of the frozen cuts. Mr. Yale reported an immediate response to the campaign. Three display ads, each four columns wide and 11 inches deep, were used.

An increase in sales of 25 per cent since the Christmas season was reported by Mr. Yale. The store's weekly sales volume on the frozen cuts is now nearly \$300 a week. During the summer of 1930 the \$400 volume was reached, when frozen cuts were a novelty in Meriden.

Mr. Yale looks for a steady increase from this time on. Word-of-mouth advertising is beginning to have its effect in stimulating sales.

Before taking on the Swift line and installing a 12-ft. Lig-onier case last summer, the Yale store handled no meats at all.

The store does a large delivery business, and was often requested to pick up orders of meat at nearby butcher shops for regular customers. The addition of the quick-frozen line eliminated this loss of time.

"National advertising on a broad scale is all that is needed to bring about general acceptance of frozen meats," Mr. Yale said. "The new cuts form an ideal adjunct to our regular line of groceries. There is no question about the future of quick-frozen meats, but the public must be educated to their advantages, and that step should not be left entirely to the retailers."

Mr. Yale reports that lamb and pork chops, liver, sweetbreads, steaks, legs of lamb, and roast beef are among the best sellers in the frozen line at present.

Despite the success which has attended the Yale store's handling of the chilled meats, no other store in Meriden has as yet taken them on as a regular line, although scattering sales have been reported by the local Swift branch.

STUCKY PLANS EXPANSION FOR EXPERIMENT STATION

Experiment, Ga.—"The Georgia Experiment Station is not only continuing its work on methods of preserving fruits and vegetables by freezing, but is enlarging its work for the coming season," declares H. P. Stucky, director of the Georgia Experiment Station.

Previous work has been devoted to types of containers, optimum temperatures, syrup concentrations and storage conditions. This work will be continued and other more technical phases will be undertaken. Special emphasis will be given to the types of ice crystals that are desirable and the conditions conducive to their formation.

The physico-chemical changes occurring within the tissue during and after freezing will be studied by determining the expansion, hydrogen ion, freezing point, reducing sugars, bound water, total water, cell wall structure, conductivity, total acidity, and respiration of fruits, especially peaches, when frozen and stored under different conditions.

A new phase of the work to be given attention is that of utilization and consumption. Not only will recipes be worked out, but the basal requirements in the use and consumption of frozen fruits and vegetables will be studied, Stucky states.

Likewise, work will be initiated in the study of the microscopic organisms which inhabit frozen fruits and vegetables during freezing and storage.

The personnel of the staff has been enlarged recently, according to the director, and new facilities for investigation have been added.

ORPHANS' HOME PURCHASES COOLING EQUIPMENT

Fort Worth, Tex.—The Griswold-Rogers Co., Inc., 813 Lamar St., distributor of General Electric refrigerators, recently installed a commercial General Electric refrigerator and a pressure water cooler at St. Theresa's Catholic Orphans' Home.

G. E. Commercial Manager Surveys New Food Field

By W. E. Landmesser
Commercial Manager, Refrigeration Dept., General Electric Co.

THE publicity given to frosted foods in newspapers, magazines and trade journals has resulted in widespread attention to these products and their possibilities.

The U. S. government is co-operating with the fruit growers in working out methods to utilize excess fruit crops. Fresh strawberries picked ripe from the vines and frozen by this quick freezing process, sealing in the original freshness and flavor, can now be purchased in many stores.

Meats and fish are perhaps receiving the greater publicity due to the energetic methods of meat packers and fisheries. Up to the present time Swift & Co. have been most active in promoting this new method of merchandising meats.

You can readily realize how thousands of carloads of peaches, for example, could glut a market and lower prices far beyond the point of profit yielding to the farmer.

Sensons Are Important

Secondly, and equally as important is the question of season. For a short period, peaches are available in abundance; then the balance of the year there is a scarcity, or such high prices prevail that only the chosen few can secure the fresh fruit.

This new quick freezing process solves the problem, equalizing the fresh fruit supply throughout the year. The peaches are bought in the fields and cut for table use. Then they are frozen, placed in paper containers and shipped in refrigerated cars.

It is predicted that 80,000,000 pounds will be placed on the market in this manner by the end of the summer of 1930. The new product does not offer competition to canned goods, because it is fresh, and bears the flavor of the fruit picked from the tree.

Fish is available on the seaboard in great abundance. Being a highly perishable product it must be carefully refrigerated for transportation. In many inland cities a prejudice exists against fish that has come from distant places.

Without this new process of refrigeration, in the form of quick freezing, the fisheries can take advantage of only part of the real potential market.

The meat packers have recognized economy in this new system of merchandising. First, in the item of transportation. Several cars were required to hold what can now be loaded, in the form of packed meats, in one car. The packaged cuts of meat mean a saving in space.

The handling of carcasses by trained butchers can be eliminated to a great extent. Small as well as large stores not now handling meats can profitably sell this product without a skilled meat cutter.

The machinery at the packing plant can cut the meats more economically and better than the average meat cutter.

This means that most any kind of a store will be able to handle frosted package foods. In the past, the meat packers had no way of identifying their meats. The packaged meats give them this advantage.

"Whys" of the Business

Why is this business new? Have we not always had frozen meats, poultry and other products? Have we not always had an aversion for frozen food products because we believed them to be inferior in quality? Then, why do we predict such success for these frosted products?

The answer is in the rate of freezing. Through the old methods of freezing—slow freezing we call it—the product was inferior in quality as it lost much of its flavor and palatability in the process of freezing. Sometimes 24 to 48 hours and longer were required to freeze the foods. During a slow freezing process the food juices crystallize and expand in the cell structures thereby rupturing the delicate tissues.

When defrosted the juices would escape, causing the product to become less nutritious as well as losing its firmness, color, and flavor; the result a dry, tasteless, less palatable article of food. This all explains the prejudice against frozen foods.

The new process eliminates the old objections. In this refrigerating method the food product is brought to a temperature, in some cases as low as 40 degrees below zero, and frozen.

The time required for freezing varies from one and one-half hours to two and three hours. During this short period

of time the expansion of the juices is not such as to rupture the cell tissues. Therefore, the product retains its flavor, color, nutrition, and juices intact.

To distinguish the old product from the new, the new products are referred to as frosted products, rather than frozen.

You can see that there is a gradual increase in temperature of the product from the time that it is originally frozen until it reaches the housewife. This temperature rise is as follows:

Initial freezing -40° to -50° F. During transportation, warehousing, and distribution to retailer the temperature may rise to 0° F. (Shipments are made in refrigerated cars.)

The retail dealer should place the product in a refrigerator maintaining 15° to 20° F. If he keeps the products several days, they will gradually come to this temperature.

The housewife should get the product at from 15° to 20° F. If it is to be kept for a week or so, it can be kept in a frozen condition by placing in the evaporator of her refrigerator.

Again, it should be remembered that if the product has started to soften, it should not be re-frozen, but should be considered like ordinary fresh food.

The process of defrosting is very simple. If quick defrosting is desired, hold under running faucet for a few seconds, otherwise simply place in a dish and permit it to defrost itself.

Taste Not Affected

The writer a short time ago was invited to partake of three portions of fish. Number 1 had been caught that day; Number 2 had been frosted six months and Number 3 had been frosted about two years. No difference in texture, taste, or color could be detected between the three portions.

Electric refrigeration must be used by the storekeeper to preserve the foods until sold. If any of these products are allowed to defrost and then are frozen again, the same thing will occur as mentioned in the old freezing methods, and the product is no better than ordinary slow frozen foods.

The foods must be kept in the frosted state until sold, and the retailer must have facilities for keeping the frozen food until purchased by the consumer.

Refrigeration equipment manufacturers are at work to develop low temperature outfits for this purpose. Display cases are in demand that will stand temperature of from 15° to 20° F. With temperatures this low moisture and vapor will quickly collect on the glass and destroy the vision.

Quality Is Necessary

Furthermore, only equipment of high quality will stand up under such temperature differentials as will exist between room and cabinet temperatures. Defrosting is another problem with low temperature refrigeration. Necessarily exaportor temperature will be low; moisture will collect more rapidly than on higher temperature surfaces.

Only frozen products should be stored in the low temperature cabinets. Fresh foods, liquids, etc., will freeze if kept at 15° to 20° F. and furthermore, they will tend to frost up the evaporators more quickly.

Whenever it is necessary to defrost the evaporator it is essential that the frozen foods do not thaw out. The frozen products might be placed in the bottom of the refrigerator and covered and then the defrosting accomplished as quickly as possible.

Some are recommending the installation of equipment in existing cabinets and cases. The danger in this is that after some months of service deterioration of the cabinet is bound to set in. Here more than ever an ice box cannot be made into an electric refrigerator.

A cabinet built for electric refrigeration is absolutely necessary, and furthermore such a cabinet must be of construction to stand up under the low temperatures.

Display features can be worked out with placards, signs, dummy cartons and other advertising media. Word of mouth selling by the storekeeper will help greatly. This thing is new and much selling by word of mouth will be necessary anyway.

WARD ELECTS LIVINGSTON

Julian M. Livingston recently was elected vice-president and general manager of the Ward Baking Corp. He was formerly head of the Livingston Baking Co., now owned by the Continental Baking Co.

FOOD DISTRIBUTION STATISTICS

FOOD sales in a number of cities in California, Illinois, Indiana, Michigan and Washington, according to the 1930 Census of Distribution covering 1929 business, reveal that a large percentage of total retail sales are made by food establishments.

Grocery stores in most instances were surpassed in sales volume by grocery stores having meat departments.

FOOD SALES AND OUTLETS IN 28 ILLINOIS TOWNS AND CITIES

	Total food sales	P. C. of all retail sales	Grocery stores with meat departments. No.	Sales	Meat markets. No.	Sales
Alton	\$ 4,379,640	29	84	\$2,819,266	14	\$ 683,175
Belleville	2,854,454	24	18	391,282	30	896,393
Blue Island	2,292,390	24	20	741,447	9	518,755
Calumet City	863,757	46	20	525,393	2	91,600
Canton	1,939,000	30	20	679,634	10	280,178
Champaign	3,405,110	19	36	1,754,331	10	329,850
Chicago Heights	3,707,309	31	28	849,626	32	884,182
Decatur	8,856,395	27	143	3,704,513	33	1,355,559
East Moline	783,745	27	21	622,217
Elmwood Park	950,231	57	11	275,916	2	104,963
Evanston	13,820,837	29	24	2,249,349	50	2,885,864
Galesburg	4,541,363	24	65	2,586,005	15	913,229
Granite City	3,375,022	29	59	2,894,533	1	173,191
Harrisburg	781,822	17	26	530,155	4	104,213
Jacksonville	1,867,738	20	23	549,032	11	308,701
Kankakee	3,791,674	25	42	1,785,976	4	494,692
Kewanee	2,583,056	27	24	1,039,421	8	384,349
La Salle	2,161,030	24	18	591,135	14	642,706
Lincoln	1,675,578	28	13	362,745	7	237,160
Moline	4,050,948	20	42	1,219,830	22	1,022,797
Ottawa	2,305,371	25	13	504,184	8	283,463
Quincy	5,023,961	23	81	2,770,069	23	627,015
Rock Island	4,387,240	24	41	1,071,055	24	846,564
Rockford	13,483,737	24	101	3,993,736	70	2,944,920
Springfield	10,755,991	24	140	4,203,015	53	2,377,090
Sterling	1,621,493	25	9	285,504	6	387,246
West Frankfort	1,890,412	32	66	1,618,545	2	74,467
Waukegan	5,719,898	24	41	2,319,246	21	1,235,669

FOOD SALES AND OUTLETS IN 23 INDIANA TOWNS AND CITIES

	Total food sales	P. C. of all retail sales	Grocery stores with meat departments. No.	Sales	Meat markets. No.	Sales
Anderson	\$ 4,644,877	22	95	\$2,761,564	25	\$ 893,553
Bedford	2,099,203	27	22	772,134	6	155,876
Bloomington	2,790,485	22	43	2,113,680	5	379,057
Connorsville	2,507,188	31	29	842,713	9	441,395
Crawfordsville	1,445,130	23	26	789,421	5	216,602
Evansville	11,976,134	25	250	6,349,585	55	1,671,279
Frankfort	1,605,895	23	31	868,520	7	213,899
Goshen	1,169,963	19	18	598,393	6	154,000
Huntington	1,988,421	23.5	34	856,323	15	769,264
Jeffersonville	1,281,564	28	27	637,789	9	174,200
Kokomo	4,046,281	26	118	3,142,425	8	346,463
La Fayette	4,300,361	22	50	2,629,255	15	732,118
La Porte	2,691,815	26	19	978,193	11	590,521
Logansport	2,657,473	24	38	1,081,053	20	678,606
Marion	2,685,132	19	82	2,129,229	5	245,414
Michigan City	4,665,726	33	21	1,283,283	21	1,005,348
Muncie	6,816,574	26	153	4,531,467	16	829,474
New Albany	2,906,615	27	79	1,563,880	13	266,519
New Castle	2,201,299	24	20	885,093	9	301,399
Peru	1,766,872	22	29	1,067,327	5	171,921
Richmond	4,751,423	23	90	2,883,067	18	760,637
Shelbyville	1,902,354	24	35	736,831	5	438,112
Vincennes	2,203,761	22	74	1,449,158	19	405,877

FOOD SALES AND OUTLETS IN 20 MICHIGAN TOWNS AND CITIES

	Total food sales	P. C. of all retail sales	Grocery stores with meat departments. No.	Sales	Meat markets. No.	Sales
Adrian	\$ 2,149,917	21	10	\$ 275,017	21	\$ 763,480
Alpena	1,474,924	27	7	327,981	16	361,211
Ann Arbor	5,051,772	19	36	2,413,056	14	1,119,339
Battle Creek	7,111,822	21	66	3,022,872	28	1,451,178
Escanaba	2,100,683	24	13	717,356	14	508,422
Grand Rapids	22,755,086	20	132	6,087,124	153	5,232,769
Holland	2,046,702	21	10	467,593	17	736,124
Iron Mountain	1,602,523	24	12	638,195	11	454,137
Ironwood	2,065,821	28	15	629,924	3	298,647
Lincoln Park	1,117,891	36	12	607,909	2	85,736
Marquette	2,463,437	34	13	1,078,968	12	427,901
Menominee	986,638	19	11	367,739
Monroe	2,826,252	23	16	860,226	21	1,016,111
Mount Clemens	2,868,154	23	31	1,687,154	9	474,957
Muskegon	7,233,866	22	42	2,055,707	36	1,145,859
Niles	1,912,300	27	21	889,570	7	326,545
Owosso	2,390,882	21	19	1,093,041	8	414,547
Pontiac	11,053,353	25	95	4,481,925	49	2,376,043
Saginaw	11,005,284	23	70	2,624,230	64	2,381,578
Sault Ste. Marie	1,868,345	21	21	1,011,813	8	308,526
Traverse City	1,634,857	19	3	165,817	12	366,662
Ypsilanti	1,375,285	18	8	560,636	6	241,123

FOOD SALES AND OUTLETS IN 14 WASHINGTON TOWNS AND CITIES

	Total food sales	P. C. of all retail sales	Grocery stores with meat departments. No.	Sales	Meat markets. No.	Sales
Aberdeen	\$ 4,382,505	24	12	\$ 556,099	15	\$1,386,905
Bellingham	4,880,576	24	24	995,033	21	1,201,913
Bremerton	2,339,000	32	4	205,888	7	504,869
Everett	5,506,091	25	15	737,070	29	1,548,372
Hoquiam	2,001,550	36	4	320,640	12	514,266
Longview	1,232,327	18	4	433,078	5	139,633
Olympia	2,315,755	25	5	222,640	15	758,276
Port Angeles	1,363,052	20	4	218,820	6	323,087
Seattle	52,345,548	20	166	8,336,284	306	11,085,106
Spokane	15,580,778	20	144	6,542,553	62	2,666,972
Vancouver	2,290,205	25	5	260,928	19	503,481
Walla Walla	3,039,951	21	7	320,237	11	466,357
Wenatchee	3,868,044	22	8	586,600	11	645,601
Yakima	4,274,550	18	15	663,500	19	990,610

INTERESTING food distribution figures reported by the Bureau of Census, U. S. Department of Commerce, in its 1930 Census of Distribution of a number of cities, are summarized by the American Institute of Food Distribution, and shown in the tables below.

Table I shows the 1930 population of each of the cities, the total number of stores selling food products at retail, their total sales, and the part that total makes in the total retail business of the city. The number of restaurants and other eating places is given with the

total sales for this group, and the percentage this makes of the total retail volume of the city. Sales and percentage figures cover only food sold through food stores; they do not include food sold through other types of establishments, such as department stores, 10c stores, etc. The average per store, per capita sales in all food stores and per capita sales in eating places are computations based on the census figures.

Table II shows the number of stores in six major types of retail food outlets, their total sales and the computed

average sales per store. Where the returns show the number of stores in a city but do not give the total sales, the number of stores is not used in calculating an average.

Table III covers only stores classified as grocery or as grocery and meat stores. These figures cannot be used to compute the proportion of total business done by independents and chains, since reports do not break down chain store figures for some cities. Census returns do not give any chain figures for cities of less than 30,000 population.

TABLE I

City	Population (1930)	Number of Stores	All Food Stores		Restaurants and Eating Places		Per Capita Sales	
			Total Sales	% of Sales in Food Stores to Total Retail Sales	Number of Stores	Total Sales	Average Per Store	% of Restaurant Sales to Total Food Stores
Tacoma, Wash.	106,817	572	\$14,338,259	23.15	103	\$1,940,017	\$18,835	3.13
San Francisco, Cal.	634,394	3,475	95,052,786	19.05	1,328	45,283,212	34,099	9.07
Peoria, Ill.	104,969	460	14,154,101	20.12	155	2,721,754	17,560	3.87
Wilmington, Del.	106,597	713	15,275,390	23.45	146	2,213,238	15,159	3.40
Salt Lake City, Utah	140,184	509	14,525,004	15.62	154	3,308,296	21,482	3.56
Denver, Colo.	287,861	1,335	57,658,296	25.70	425	9,551,980	22,475	4.26
Lansing, Mich.	78,397	286	10,885,503	19.98	76	1,908,144	25,107	3.50
Lima, Ohio	42,287	199	4,914,315	18.39	40	881,714	22,043	3.30
Kenosha, Wis.	50,262	236	7,473,997	30.09	133	1,045,684	7,862	4.21
Umatilla Co., Ore.	24,399	87	2,473,000	20.00	28	476,000	17,000	4.00
Coos County, Ore.	28,373	146	4,048,000	30.00	34	401,000	11,794	3.00
Skagit Co., Wash.	35,142	128	4,078,000	27.00	34	428,000	12,588	3.00

TABLE II

City	Grocery		Grocery and Meat		Meat Markets	
	Number of Stores	Total Sales	Number of Stores	Total Sales	Number of Stores	Total Sales
Tacoma, Wash.	268	\$ 6,153,071	62	\$ 1,756,651	83	\$ 3,384,812
San Francisco, Cal.	1,760	42,087,292	141	7,883,791	532	19,289,694
Peoria, Ill.	134	3,504,223	177	6,304,257	55	2,412,682
Wilmington, Del.	118	2,065,082	274	5,767,988	101	3,332,438
Salt Lake City, Utah	234	4,467,421	114	5,407,787	67	2,653,100
Denver, Colo.	349	4,659,284	490	40,078,780	182	5,157,631
Lansing, Mich.	68	1,891,439	95	4,333,801	64	3,449,995
Lima, Ohio	37	827,206	109	3,423,302	14	264,556
Kenosha, Wis.	66	1,997,089	71	2,234,147	46	1,834,739
Umatilla County, Ore.	45	1,765,000	39,222	*	18	497,000
Coos County, Ore.	89	2,717,000	30,528	*	26	758,000
Skagit County, Wash.	77	2,953,000	38,351	*	19	722,000

TABLE II—(Cont'd)

City	Dairy, Eggs and Poultry		Fruits and Vegetables		Delicatessen	
	Number of Stores	Total Sales	Number of Stores	Total Sales	Number of Stores	Total Sales
Tacoma, Wash.	13	\$ 766,504	26	\$ 449,706	2	\$ 17,300
San Francisco, Cal.	91	3,727,300	262	6,261,692	136	\$3,302,039
Peoria, Ill.	6	473,888	5	168,016	*	*
Wilmington, Del.	14	687,517	44	674,479	12	237,442
Salt Lake City, Utah	4	140,023	11	185,290	1	*
Denver, Colo.	70	2,767,194	49	1,370,767	20	479,002
Lansing, Mich.	1	*	2	*	1	*
Lima, Ohio	*	*	3	71,675	*	*
Kenosha, Wis.	4	925,219	6	85,009	4	88,319
Umatilla County, Ore.	*	*	*	*	*	*
Coos County, Ore.	*	*	*	*	*	*
Skagit County, Wash.	*	*	*	*	*	*

TABLE III

City	Independent Stores			National and Sectional Chains			Local Chains		
	Number of Stores	Total Sales	Average per Store	Number of Stores	Total Sales	Average per Store	Number of Stores	Total Sales	Average per Store
Tacoma, Wash.	287	\$ 5,663,240	\$19,733	11	\$ 758,218	\$68,929	32	\$ 1,488,264	\$46,508
San Francisco, Cal. . .	1,492	31,774,311	21,296	194	9,604,993	49,510	215	8,591,779	39,962
Peoria, Ill.	216	5,334,774	24,698	69	3,286,201	47,626	26	1,247,505	47,981
Wilmington, Del. . . .	354	5,534,538	15,634	*	*	*	*	*	*
Salt Lake City, Utah. .	294	6,875,322	23,385	40	2,501,484	62,537	14	498,402	35,600
Denver, Colo.	677	33,147,290	48,962	113	8,048,252	71,223	48	3,465,080	72,180
Lansing, Mich.	102	2,940,811	28,831	48	2,904,016	60,500	13	380,413	29,200
Lima, Ohio	111	2,236,004	20,144	20	1,007,765	50,388	14	840,531	60,038
Kenosha, Wis.	104	2,439,464	23,456	22	1,413,472	64,249	11	378,300	34,391
Oshosh, Wis.	92	2,320,442	25,222	16	684,462	42,779	8	237,236	29,655

VIOLET RAY GIVES FOODS VITAMIN D

By Verne Burnett
General Foods Corp.

SCIENTIFIC developments in the use of light rays to increase the nutritive and health-giving properties of foods, which are expected to have far-reaching effects in the food industry, have been announced jointly by the University of Cincinnati and General Foods Corp.

Among a widely diversified number of applications, the new discovery, which was made in the Basic Science Research Laboratory of the University of Cincinnati, can be used to add Vitamin D in definitely controllable quantities to many articles of food and pharmaceutical products. Various germs of fermentation, yeast moulds and similar foes to preservation of foods are said to yield to the University's light treatment methods. Its discoverers even see in it potentialities for the destruction of germs of disease inside the human body without injury to the living tissues.

Unusual Combination Announced

The announcement reveals an unusual arrangement between an industrial enterprise and an educational institution. To make possible utilization by the public of products resulting from the new discoveries in the field of light rays, a co-operative alliance has been arranged by General Foods Corp. and the University of Cincinnati, through the newly formed General Development Laboratories, Inc., according to the statement issued jointly by President Herman Schneider, president of the University, and C. M. Chester, Jr., president of General Foods.

The new development, known as "selective irradiation," is basically protected under the patent laws. Mr. Chester stated that the General Development Laboratories, Inc., will license other concerns in the general fields and will sell irradiated products which may be required in manufacturing processes.

"Through this new development the field of usefulness of radiations can be greatly expanded because it is now possible to control them in the degree and amounts used," said Mr. Chester. "In addition to the impregnation of everyday articles of food with controlled amounts of Vitamin D, the pharmaceutical and medical field offers vast possibilities. Further, the process can be used to stimulate plant growth. When applied to poultry and stock feeds, experiment has demonstrated that healthy animal growth has been materially stimulated.

"Therefore, we believe that because of the wide application of the processes, this development is perhaps the most important food discovery since the identification of vitamins," he said.

Vitamin D is best known for its effectiveness in maintaining general health, in the prevention and cure of rickets, and in building sound bones and teeth. Since its discovery, scientists have been seeking methods of providing artificially the desired amounts of Vitamin D, at the same time avoiding the destructive effects incidental to the use of artificial methods.

Many Experiments Conducted

The basic discovery upon which the process has been developed was made by Professor George Spertl, Director of the Basic Science Research Laboratory of the University of Cincinnati, and his colleagues. During the last three years thousands of experiments have been completed on laboratory animals, poultry, and plant life.

The effectiveness of certain substances, notably cod liver oil, in the prevention and cure of rickets, was first discovered by scientists about the year 1827. It was in the present century that vitamins were definitely identified, however, and the one vitamin most essential to the building of strong, healthy bones and teeth was found to be created by summer sunshine.

Once Vitamin D was definitely associated with sunshine, science quickly revealed that it was present only in the ultra violet rays, which are invisible. The next step was to utilize these ultra-violet rays created artificially. Obviously, mankind could not spend all its daylight hours in the sunshine.

Also, it was discovered that in the temperate zone, ultra-violet was to be had from the sun only during the warm months. Several types of electrical devices were developed which reproduced more or less of the ultra-violet "band" or range of rays, and it became possible to develop Vitamin D artificially.

When Professor Spertl and his scientists attacked the problem, however, they found that only a part of the total ultra-violet band of light waves was needed to produce Vitamin D. They discovered a definite point on the ultra-violet scale at which Vitamin D was produced in quantities desired in foods or medicinal products. However, they found that at lower light frequencies in the ultra-violet band, they are destroying Vitamin D as fast as they were cre-

Refrigeration Modernizes Old Finland Market Hall



Crowded with tradition is the 150 years old Market Hall at Viborg, Finland. It was built when the people of Finland were rejoicing over the new constitution granted them by the King of Sweden.

First oil lamps and candles, then gas and finally electricity illuminated its cellars. For fifteen decades men have struggled to keep its yawning cold rooms filled with huge blocks of ice.

Now in place of huge blocks of ice Frigidaire 570-F coils and a "C" compressor are keeping the rooms at the required temperature.

MEXICANS PLAN TO ERECT BIG CO-OPERATIVE PLANT

Mexico City, Mex.—A meat packing house, equipped with American-made refrigeration, is soon to be established in San Luis Potosi City, capital of the state of that name, as part of a large agricultural enterprise that is being undertaken by a Mexican organization known as the "Canaderos de las Huastecas" (Cattlemen of the Huastecas).

The enterprise, which is co-operative, has been financed to the extent of 3,000,000 gold pesos (approximately \$1,500,000), by the Compton Investment Co. of San Antonio, Tex.

Besides a large slaughter house and storage warehouse in San Luis Potosi City, the organization contemplates establishing branches in all the principal cities of the Republic. The transportation of meat and other similar products from town to town in refrigerated automobile vans, is also planned.

ating it, and were creating other undesirable products.

This is essentially the University's discovery, as it applies to Vitamin D—that Vitamin D begins to be produced at a definite point in the ultra-violet ray region. Once this point is passed, Vitamin D is formed; but at certain definite points beyond this, other objectionable effects begin to be produced which are destructive to Vitamin D and harmful to the food or medicinal product being treated.

By elimination of the radiations producing these objectionable effects, Vitamin D can be created in large quantities and the time of irradiation can be prolonged indefinitely without destruction of the vitamin and without harmful effects. In addition, the new discovery is helping to solve a number of problems of great importance such as in the sterilization of foods and the prevention of spoilage.

Research Laboratory Erected

General Foods Corp., seeing the relation of these researches to its own laboratories, proposed a co-operative arrangement which has resulted in the joint holding company for practical utilization of the discoveries. It is stated that the portion of the revenues accruing to the University from the General Development Laboratories, Inc., will be devoted to further researches in the field of the basic sciences, with special emphasis on their benefit to mankind.

The new arrangement between the University and General Foods includes the erection at the University of a laboratory especially designed to carry forward more intensively the research work which led to the discoveries now being given commercial application.

Officers of the General Development Laboratories, Inc., are: Ralph G. Coburn, executive vice-president of General Foods Corporation, president; Lewis W. Waters, vice-president in charge of development of General Foods, vice-president; John S. Prescott, vice-president of General Foods, secretary.

These officers, with President Herman Schneider and Professor Spertl, representing the scientific interests of the University, constitute the board of directors. L. A. Zahrn, treasurer of General Foods, is treasurer of the new corporation.

New Storage Process For Citrus Fruits

Howey, Fla.—The first tank to preserve grapefruit and oranges in their natural freshness without refrigeration is now under construction, according to W. J. Howey, who is developing a 60,000 acre citrus tract in this city.

Howey also announces that he has control of the storage process for Texas and Florida. One thousand boxes of fruit may be stored in the new tanks.

In the development, Howey is using the Rudd method of storing fruit in steel tanks free from the oxygen of the air that causes decay. Howey claims it is much cheaper than refrigeration.

"If it is successful," declares Howey, "it will be a revolutionary development in the citrus industry. The dollar-a-box fruit of the winter season will become \$6 and \$8 a box in July, August and September."

Fruit from the first tank will be released next August.

ESTIMATES 15,000 GROCERS MODERNIZED STORES IN '30

New Orleans—Modernization of grocery stores has gone forward at a rapid rate during 1930. Approximately 15,000 grocers have changed their store arrangement in accordance with modern methods during the past year.

A summary of this modernization campaign covering a three-year period reveals, according to this writer, that approximately 20,000 grocery stores remodeled during the two-year period, 1928-29, bringing the total to 35,000, and in addition, 25,000 more stores have made some changes, have cleaned up, painted up, junked obsolete equipment and added new furnishings, and generally improved their appearance and efficiency, thus bringing the total to 60,000. —Progressive Grocer.

NEW CITRUS COOLING PLANT USES REFRIGERATION

Tustin, Calif.—The York Ice Machine Co., 5051 Santa Fe Ave., Los Angeles, will supply refrigeration equipment to the new citrus pre-cooling plant here, which will be erected for The Tustin Hills Citrus Association.

The building will be two stories high, 80 x 80, and will have a capacity for 10 carload shipments a day.

Costing \$85,000, the building will be constructed of reinforced concrete.

Another Southern California pre-cooling citrus plant is to be constructed at Villa Park for the Villa Park Orchards Association by the Gay Engineering Co., 2650 Santa Fe Ave., Los Angeles, at a cost of \$75,000.

ARMOUR MAN TRANSFERRED

Chicago—F. O. Miller, former manager of Armour & Co., Savannah, Ga., has been transferred to Atlanta. His successor is Joseph A. Mendel.

Harry J. Baker has retired after 31 years of service with the same company. He was manager of the Savannah beef department. W. H. Cotter will take his place.

LUNCH ROOM INSTALLS SPECIAL COOLING DEVICE

Pittsfield, Mass.—L. R. Sweatland, Inc., Frigidaire dealer, has installed for Gamborini Bros. in their Busy Bee Lunch Room here, a device for their display counter, by which a compartment for milk and bottled goods, a pan for whipped cream and salads, and a supply of drinking water are all cooled by use of a single coil.

The case is open at the top and the foods and drinks in the larger compartment are partly submerged by water, while the salad tank is dry or carries a small quantity of ice.

This arrangement supplements a walk-in cooler with a Model U compressor of 3/4 h. p. installed by the same concern.

BIG WATER COOLER DEMAND PREDICTED

Cleveland—Water cooler sales in 1931 will break all records, thinks W. E. Landmesser, G. E. commercial manager. Commercial refrigeration of all varieties will show a steadily rising demand, he believes.

"Purchases of water coolers by large industrial plants, factories and mills herald a new wave of purchasing power and prosperity," maintains Landmesser.

"The large number of commercial refrigerator sales to hospitals, schools, clubs, institutions of all types, stores and every other classification of commercial refrigerator users, sets a new mark in our business.

"All forecasts by the building industry clearly show that hundreds of millions of dollars will be spent on industrial plants, schools, hospitals and office buildings, together with many other commercial projects which will present enormous possibilities for new commercial business in both refrigerators and water coolers.

"Better planning of our work and the training of new talent in the sale of commercial refrigeration is our greatest need this year. The new selective selling plan for water coolers and other selective selling plans to follow will help distributors, dealers and utilities to accomplish both of these objectives."

PRODUCTIVITY OF SPACE IN DEPARTMENT STORE LOW

Washington—Professor Malcolm P. McNair, director of the Bureau of Business Research, Harvard University, has recently announced that "the sales per square foot of total space in department stores with volume of over \$1,000,000 in 1928 were \$20; and for stores with volume between \$4,000,000 and \$10,000,000 the sales were approximately \$28 per square foot."

With greater productivity of space, the educator believes, greater sales per capita by the staff should follow. Professor McNair also told the National Retail Dry Goods Association "that per capita output in the department store field is too low."

Using the year 1928 as a comparison, he states that sales per employee in stores selling over \$1,000,000 each totaled \$7,200; while sales in stores with volume of between \$4,000,000 and \$10,000,000 each approximated \$7,600 per employee.

"One reason why these totals are so low is that non-selling workers are included in the tabulation, and rightly so, because the latter must also live off sales," he concludes.

TO HELP YOU MAKE MORE SALES

If you are a manufacturer, distributor, or dealer, you can use the *Refrigerated Food Section* as a definite aid in the promotion of commercial sales. Simply see that it reaches your commercial prospects.

In the *Refrigerated Food Section* will be found news and information of interest to meat merchants and grocers, chain store executives, ice cream manufacturers, druggists, confectioners, restaurant owners, and all food service establishments.

Your prospects will be better informed on the advantages of up-to-date refrigeration equipment by reading the *Refrigerated Food Section*.

Use the blank below to order extra copies for distribution by your salesmen. Or send to *ELECTRIC REFRIGERATION NEWS* the names of companies to which you would like to have sample copies sent.—Editor.

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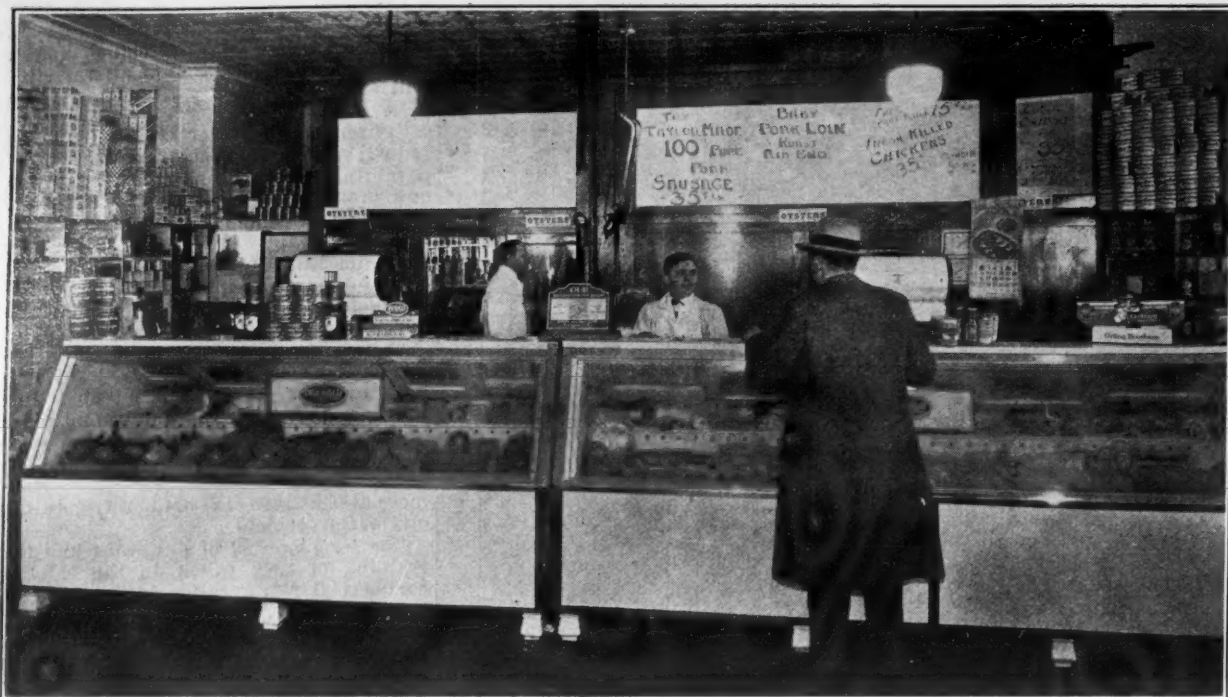
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Attractive Display Cases Draw Customers



Completely equipped with electric refrigeration is the Taylor Market in Detroit. Three "Dry-Kold" display cases, two for meats and one for dairy products, are cooled by Kelvinator equipment. Supplementing this equipment is a large "Dry-Kold" cooler in which reserve stocks are kept.



In Schmidt's Grocery, Crown Point, Ind., electric refrigeration equipment was recently installed in the meat department by Schmall & Seberger, Kelvinator dealers.

Cooling the display case and the walk-in cooler is a Kelvinator 1 3/4 h.p. unit. Since installing the equipment, the proprietor of this grocery reports that his refrigerating costs have been reduced considerably.



Two General Electric commercial refrigerators are on duty in a grocery store at 6728 Germantown Ave., Philadelphia. After buying the first model, it was found necessary on account of the increase in business to order a second one from Judson C. Burns, distributor.

Large stocks of fresh vegetables, as can be seen in the photograph, are carried in this grocery store. Meats, including poultry, are also handled.



The Roosevelt Market in Jackson Heights, L. I., N. Y., has its walk-in cooler, three double duty display cases and a dairy cooler hooked up to Copeland refrigerating equipment. In this market it is possible for housewives to make complete food purchases, as a number of shops are operated in the same building.



Following the recent remodeling of the Central Market in Columbus, Ohio, the 70 independent butchers, who operate under its roof, purchased new refrigeration equipment. Display cases of special design were supplied by the McCray Refrigerator Co. of Kendallville, Ind., and the Herrell Co. of Columbus.



Quick-frozen meats are sold in the Nash Food Shop, operated by Grant W. Nash, in Downers Grove, Ill. He maintains a large staff of clerks so that no customer needs to wait before being waited on.

Providing the necessary refrigeration for perishables handled in this store are two Copeland condensing units, which cool two Warren cases and a Warren cooler.

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office.

The business newspaper of the refrigeration industry

ISSUED EVERY TWO WEEKS
VOL. 5, No. 15, SERIAL No. 117Copyright, 1931, by
Business News Pub. Co.

DETROIT, MICHIGAN, MARCH 25, 1931

Entered as second class matter
Aug. 1, 1927, at Detroit, Mich.FIFTEEN CENTS PER COPY
TWO DOLLARS PER YEARCABINET SHEET
STEEL REQUIRES
SPECIAL PROCESSEnameling Iron Gets Pickling
Treatment So Porcelain
Will StickBy Hugh W. Wright
American Rolling Mill Co.,
Middletown, Ohio

UP to a certain point in the conversation, the salesman who was trying to interest me in an electric refrigerator certainly knew his product. Construction details slipped easily and convincingly from his tongue. Then he spoke of "that serviceable, lustrous porcelain enamel."

"It looks good to me," I commented. "But tell me something about the metal that's under the porcelain."

I had him there. He knew who manufactured the metal, but he had none of the convincing facts about enameling iron which might have helped clinch the sale.

To the layman, all sheet metal looks alike. Many folks have the opinion that the sheet manufacturer supplies all orders from one pile of sheets. The truth of the matter is that each sheet is especially manufactured and processed so it will possess certain inherent qualities enabling it to be used for some definite purpose in our customer's plant.

There are, for example, many different grades of sheets used in the family automobile. The body, the hood, the fenders, the radiator, and many other parts of your car are really all made of different kinds of sheets, though on the surface they may appear to be exactly alike. Sheet manufacturing today is a highly specialized job, combining research, scientific control of product, and a high degree of technique in workmanship.

Enameling iron is even more difficult to make than auto sheets. Not only must it be formed and bent into a thousand different shapes without straining or breaking, but it must have a special surface which the liquid porcelain can penetrate and grip. If it contains harmful gases, the heat of the enameling irons will liberate them.

Naturally they will work out through the porcelain coating, causing pin holes or blisters, or perhaps remain undiscovered until Mrs. Housewife over in Oshkosh discovers a piece of the porcelain coating on her treasured refrigerator has suddenly broken loose. Is it any wonder the iron manufacturer goes to a lot of extra trouble so his sheet metal will stand up under the severe requirements of the refrigerator manufacturer?

In the first place the enameling iron manufacturer knows that he can't make high-grade sheets without high-grade raw materials. He buys only the select grades of melting stock, coke, ore and

(Concluded on Page 7, Column 1)

UNIVERSAL INSULATION CO.
TO SELL NEW INSULANT

Detroit—A new refrigerator insulant has been announced by the Universal Insulation Co. in the Penobscot Building here. James A. Nagy is president of the firm, and Frank R. Watson, secretary-treasurer.

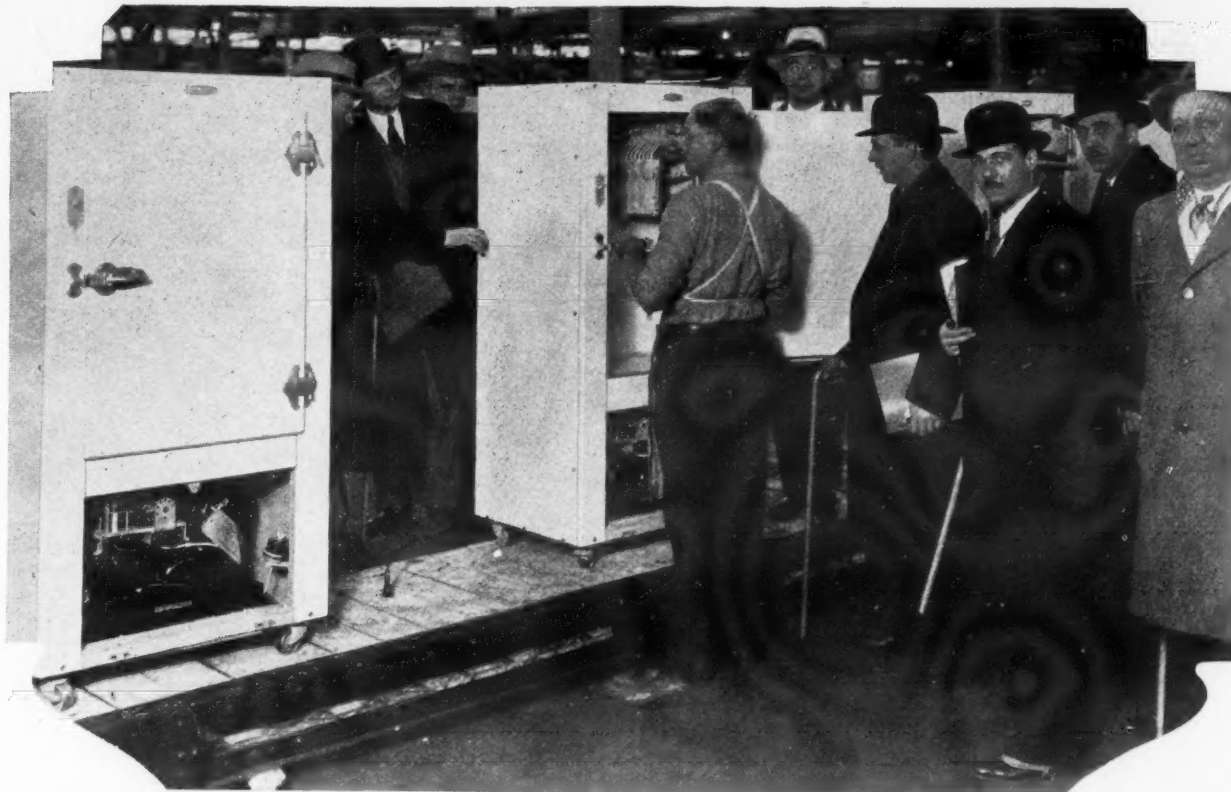
Rock wool is used for the base of the insulation. This material is mined near Wabash and Alexandrine, Ind., the fibers separated and foreign matter removed, and a clay binder added. It is then pressed to the desired size and thickness, and passed through a series of ovens. After the blocks are pressed again, they are ready for application.

The insulant is light in color. It can be furnished in bricks or sheets, or in forms for enclosing piping. Thicknesses range from 1/4 in. to 4 in.

HARBERS TO DIRECT N. Y.
JURUICK SALES

New York City—W. J. Harbers has been put in charge of Juruick refrigeration sales activities for the American Engineering Co. in the New York district, with offices at 40 W. 40th St. Mr. Harbers was formerly with the Brunswick-Kroeschell Co.

New Frigidaire Models In Production



Frigidaire Star Salesmen Inspect Production of New Porcelain-on-Steel Household Models

DRY-ICE PATENTS NOT
VIOLATED BY CARBICE

Washington, D. C.—Without disturbing the validity of Patent No. 1,595,426 owned by the American Patents Development Corp., and used by the DryIce Corp. of America as exclusive licensee, on March 9 the United States Supreme Court decided that the Carbice Corp. was not infringing on the rights of the DryIce Corp. The defendant denied both patent validity and infringement.

In the same suit, the Federal Circuit Court of Appeals had held the patent valid, and earlier the Federal Court of Eastern New York, without passing upon validity, had dismissed the bill on the ground that infringement had not been shown.

The Supreme Court said that if the patent is valid, the owner can prohibit the manufacture, sale, or use of the packages, or grant licenses.

However, the court held, just because the Carbice Corp. manufactures solid

(Concluded on Page 9, Column 1)

Air Conditioning

The recent progress of air conditioning, and its new applications in railroad coaches, homes, manufacturing plants, and public buildings will be featured in the next Engineering Section of the News, April 8, 1931.

CENTURY ANNOUNCES NEW
LINE OF SMALL MOTORS

St. Louis—A new line of fractional horsepower motors has been announced by the Century Electric Co. The new motors have interchangeable mounting dimensions, are offered in the repulsion induction single phase, split phase single phase, squirrel cage induction three phase, and direct current types.

The motors have rolled steel frames, welded steel feet, slotted for belt adjustment, and bearings machined from phosphor bronze castings.

SCULLEN DESCRIBES
CONDENSER STUDIES

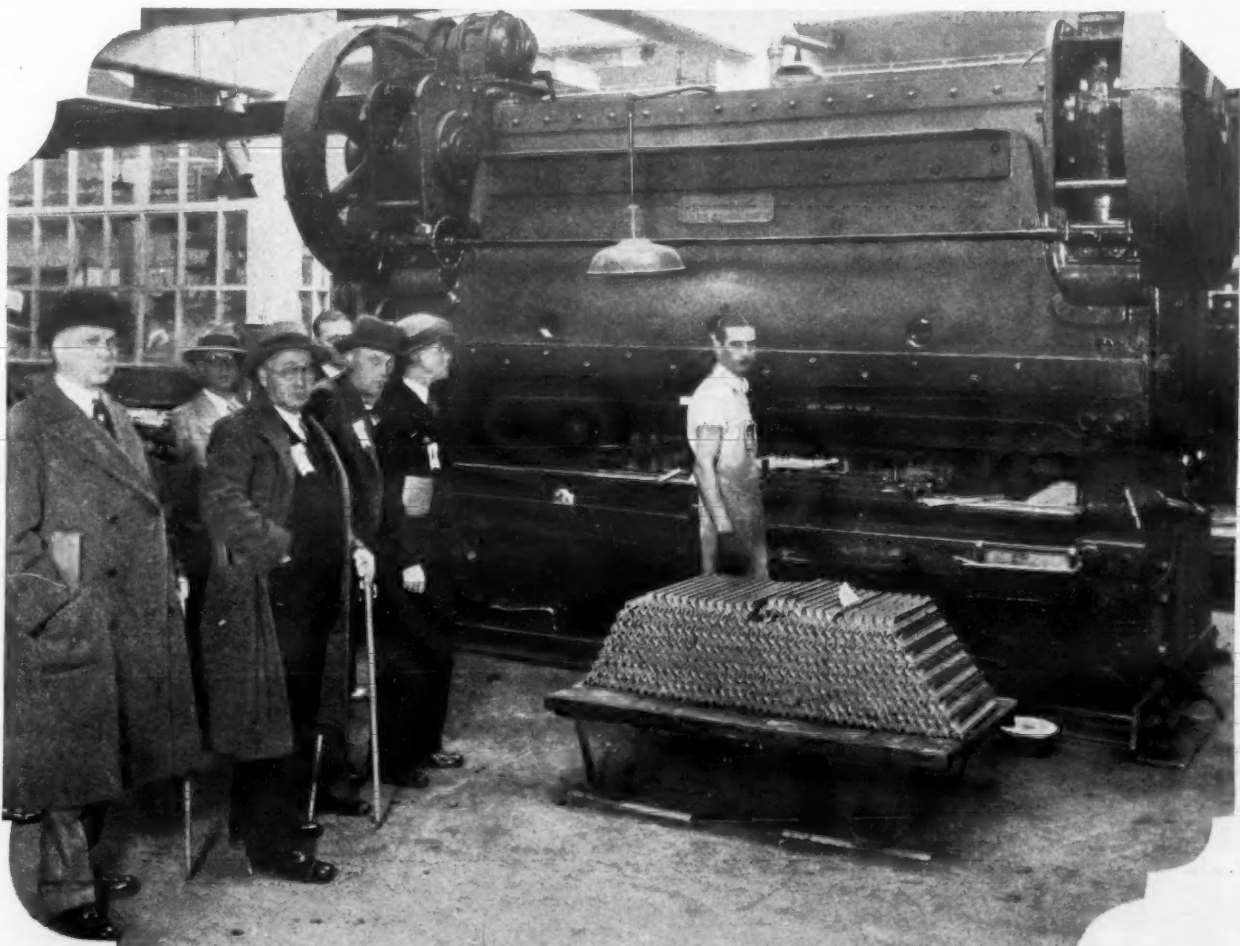
Detroit—Partial results of about a year's study made in Kelvinator laboratories on air-cooled condensers for small refrigerators, were presented by Hugh Scullen of Kelvinator Corp. in the March 16 meeting of the Detroit section of the A. S. R. E.

Dr. L. A. Phillip, director of Kelvinator research, pointed out the important influence the development of successful air-cooled condensers has had in the household refrigerator field.

Mr. Scullen then described the experimental set-up of the tests. The first consisted of a wind-tunnel with a fan at one end, and mountings for tested condensers at the other. A Pitot tube was used to measure the air velocity in the duct, while thermo-couples measured the temperatures of the air before and after leaving the condenser. An electrical resistance heater placed

(Concluded on Page 3, Column 1)

Salesmen See Punch Press in Action



Giant Punch Press Used in Frigidaire's Line Production

ESTIMATING OF
DISPLAY CASES
IS ILLUSTRATEDScientific Conception Important
In Figuring Commercial
InstallationsBy W. J. Aulsebrook
Commercial Sales Manager
Serval Sales, Inc.

WHEN fractional ton refrigeration became popular less than 10 years ago, engineers undertook to apply the methods of calculations used for cold storage plants, ice making and kindred work. In fact, there was no other method open to them without extensive and costly research. However, it soon became apparent that the rules applying to a cold storage room 50 ft. square could not be trimmed down to fit one 6 ft. square by direct proportion.

The uninsulated areas were different, the service loads were in different ratio, and the variations of service load were confusing. Furthermore, the economics of the problem were different.

The wholesale storage room was set up to carry on a definite operation over a period of 20 or 30 years, and was equipped accordingly; while the corner grocery could not afford to look forward for even half that length of time. Retail methods change too rapidly.

For this reason, early calculations on small machines resulted in some installations that were impractical and, as we look back now, really ludicrous.

We have all seen "calculations" which showed that a 14-ft. display case required a 1,000-lb. machine, and others that justified the use of a 500-lb. machine on a 10 x 10 ft. cooler.

In either instance the service problem was a nightmare, and the performance was unsatisfactory. The next tragic step was to throw out all engineering calculation and resort to guesswork.

For a time, good (or lucky?) "guess-timators" were in big demand. About all that a man needed, to gain a reputation, was half a dozen jobs which hadn't been thrown out by the purchasers.

Undoubtedly the true course lies somewhere between these two extremes. What we need is a clear conception of the scientific side of the question, coupled with the courage to temper our calculations with ordinary common sense. We must appreciate that there is a human element in every sale that cannot be taken into account on a slide rule. "Satisfaction" is a broad word and not every purchaser has the same conception.

The writer has seen machines condemned by the purchaser when they were actually giving excellent results, and has seen other owners write enthusiastic letters of recommendation when their installations were failures.

These conditions cannot be blamed or

(Concluded on Page 2, Column 1)

E. D. MADDEN APPOINTED
DELCO SALES MANAGER

Dayton, Ohio—Promotion of E. D. Madden to the position of service manager of Delco Products Corp. has been announced by B. D. Kunkle, president and general manager of the company.

Mr. Madden has been assistant service manager since 1929, and has been connected with the company for the past seven years, first as assistant service manager of the old Delco Co. at Dayton.

In 1926 he was transferred to Anderson when the Delco Co. and the Remy Electric Co. merged as the Delco-Remy Corp., later returning to Dayton in charge of service for the Dayton plant.

GIRLS ARE FAST WORKERS
IN SOLDERING JOBS

Buffalo—Girls have been found more efficient workers in many soldering operations at the Fedders Manufacturing Co. of this city.

Particularly in the soldering of copper tubes in cooling units they are neater workers, faster, and do a neater job than men, according to Roy G. Nelson, quality manager of the electric refrigeration division.

Aulsebrook Shows How To Estimate Display Case Installations

(Concluded from Page 1, Column 5)

credited to "calculation." They are sometimes due to the natural temperament of the customer, but more often to the methods used by the salesman. "Get the order" tactics without regard for methods often sow the seed for a disgruntled customer.

In all justice to the salesman we must admit that it is not often his intention to overstep. A salesman must have imagination if he is to be successful, so we must not condemn him if his imagination overruns a little at times. If he is asked a question, he must answer it, and sometimes his answer is wrong.

Up to date very little has been done to educate the salesman in giving the right answer. He is handed a case full of literature, listens to a "pep" talk by the sales manager, and fares forth in search of business.

For the reason suggested above, a plan of commercial calculation must be mixed liberally with suggestions as to the sales methods to be used in presenting the results of these calculations, and even the service practice to produce the desired results.

Very few organizations countenance guaranteed temperatures, yet every prospect wants to know how cold his products are to be kept, and every salesman has to promise something on this point.

The writer has found the best criterion in this matter to be the table agreed upon some two years ago by the Joint Committee of the Association of Refrigerator Manufacturers and the Association of Ice Machine Manufacturers.

Not everyone agrees with this table, but the writer feels that it is the only standard having authoritative backing at the present time, and it gets results

without working a hardship on anyone else. This table follows:

Description of Cabinet	Location of Thermometer	From Deg. F. Named Below	To Deg. F. Named Below
Small market cooling room	Center of rear wall.....	38	45
Large storage cooling room	Center of rear wall.....	36	42
Grocer's refrigerator	Small lower compartment.	42	48
Restaurant service refrigerator	Small lower compartment.	42	48
Restaurant storage cooling room	Center of rear wall.....	38	45
Florist's refrigerator	Center of bottom.....	42	48
Top display case	Center of bottom.....	42	48
Floor display counter	Center of bottom.....	36	40
Floor display counter, heavy construction	Center of top shelf.....	44	48

Conscientious salesmen will not promise temperatures below the lower limit of this table, and all will agree that temperatures above the upper limit are approaching the danger line.

With proper machines and coils we can maintain the lowest temperatures without accumulating frost on the coils and without harmful dehydration of the product.

Dehydration and excessive operating cost are likely to be encountered if we attempt to go below the lower limit of the table, even two or three degrees. Even highly perishable food is as safe at the recommended temperature as it is two or three degrees lower.

Assuming, then, that we are agreed on the acceptable temperature inside the cabinet, we must look next to the temperature outside the cabinet.

Formerly all rooms were assumed to be 90 deg. F., but for the fractional ton machine we must get closer to the facts.

Figuring a 90 deg. F. room in northern Wisconsin will never get the dealer any business, and using the same figure

in Louisiana will result in overloading. We must go to our local weather bureau and get the facts regarding the mean temperature of the hottest summer day, and also the mean for the hottest month. We should base our calculations on these so that we have at least 50 per cent reserve on the hottest summer day, or a 100 per cent reserve on

the average summer day.

To state this in another way, our machine should not be asked to run more than 12 hours on an average summer day, nor more than 16 hours on an extremely hot day.

If we sell less capacity than this, our machine will wear out rapidly due to overheating, oil thinning, high head pressures, and a host of other evils.

Too Large a Machine

If we sell a machine that is much larger than this it will be critical to adjust and the customer's investment may not be justified by the extra life obtained.

Having decided on the temperatures inside and outside our cabinet we must next investigate the quality of the walls separating these two extremes. Old timers will observe that I have said "quality of the walls." I have not said "insulation." Therein lies much of the source of error in calculation. All walls having, for example, three in. cork have been calculated as equal, when in reality design methods and workmanship play

as much, if not more, part in the matter than mere insulation thickness.

Perhaps some refrigerator cabinet manufacturer will come forward and tell us just what all these factors are, but to the writer it seems that the essentials for a good wall are as follows:

1. Its joints must be substantially airtight to prevent actual passage of warm air in from outside.

2. The exterior covering must be of closely matched lumber or of seamless metal to prevent moist air from filtering into the insulation.

3. The heat-conducting materials (framing, bolts, braces, etc.) must be kept to a minimum so that the insulation constitutes a heat barrier at all points.

4. All service doors and windows must be true, air-tight by gasket or otherwise, and preferably self-closing.

5. The insulation must be applied in such a manner that it will hold its position, will not settle and will not absorb moisture. We will not concern ourselves with the nature of the insulation, provided it is one of the common commercial insulants in current use, applied as recommended by its manufacturers.

The quality of the wall, however, does depend very much on the thickness of insulation used, and this point must always be determined. If the origin of the refrigerator is uncertain, it will be well to drill a small test hole from the inside of the cabinet and later plug this with a cork. In this way we can be sure the insulation is quite dry and also measure its thickness accurately.

6. Air circulation from the coil over the food and back to the coil again must be directed by properly designed decks and baffles.

Wall Classification

We can now classify our wall as follows: A. Four in. of high grade insulation, properly protected. B. Three in. of high grade insulation, properly protected. C. Two in. of high grade insulation, properly protected. D. One in. of high grade insulation, properly protected, or two to three in. of questionable quality.

Only one further fact needs to be ascertained, to calculate properly the average installation, and that is the exterior surface of the cabinet. This is obtained by measuring the width "W," the depth "D" and the height "H," and computing the total area as follows:

$S = W \times D \times 2 + W \times H \times 2 + D \times H \times 2$

The beginner may regard the collection of these data as a rather complicated task, and to one who has not had any experience it does require time and care. However, after a man becomes familiar with the various makes of refrigerators in his territory he can classify the wall by looking at the nameplate and the only thing he has to do is to measure the exterior dimensions.

To summarize briefly the foregoing material, we are now in possession of the following facts before we start any calculation:

1. Desired temperature in the cabinet (from table).
2. Expected mean temperature outside (from local weather bureau).
3. Wall classification (A—B—C or D).
4. Surface on outside of cabinet.

There are certain fundamental formulae that make it possible to calculate the total load from these factors, but the writer has found that arithmetical errors, and errors in judgment are likely to mislead the average salesman, and

the following plan has been worked out to simplify this as much as possible:

Rule
Multiply the number of square feet of wall surface by the proper factor from the following table and point off two places from the right.

Class Wall	A	B	C	D
Factor	105	115	140	200

The result will be the number of pounds of ice melting equivalent necessary to maintain the interior 50 deg. F. below outside temperature. This applies directly to a large proportion of the United States and for a 40 deg. F. cabinet temperature in a 90 deg. F. room. To correct the result for 100 deg. room, add 20 per cent; for an 80 deg. room, subtract 20 per cent.

The figure thus obtained will cover leakage and service on a market cooler or similar application, but must be increased if fresh killed meat is handled.

Service Load

For grocery cabinets or short order restaurant cabinets the service load is greater and must be taken into account. The following corrections will be found to compensate for this difference for all practical purposes:

Grocery service add 15 per cent.
Restaurant service add 35 per cent.

(Always figure restaurant kitchen refrigerators at 100 deg. F. in the north, or 110 deg. F. in the south.)

To clarify this explanation we will run through a typical example:

Assume a cooler 8 x 6 x 10 ft. at 40 deg. F. average, in a 90 deg. F. room, three in. standard insulation.

$$S = 2(8 \times 6) + 2(8 \times 10) + 2(6 \times 10) = 96 + 160 + 120 = 376 \text{ sq. ft.}$$

$$115 \times 376 = 43,240 \text{ or } 432 \text{ lbs. ice equivalent.}$$

If our room temperature is 100 deg. F., we add 20 per cent, giving 518 lbs. ice equivalent, or at 80 deg. F. it is reduced to 346 lbs.

Similarly, a restaurant refrigerator 6 x 3 x 6 ft. in a 100 deg. F. room with 2 in. corkboard insulation would be figured thus:

$$2(6 \times 3) + 2(6 \times 6) + 2(3 \times 6) = 36 + 72 + 36 = 144 \text{ sq. ft.}$$

$$144 \times 140 \times 1.2 \times 1.35 = 32,800 \text{ or } 328 \text{ lbs.}$$

If the manufacturer rates his machine in terms of melting ice equivalent, choose a machine capable of delivering this amount of ice equivalent operating 12 to 16 hours. If the coil is also rated in terms of ice equivalent, choose it in the same manner, after checking the bunker dimensions. If the manufacturer rates his coils in terms of square feet of surface, choose one having surface equal to the cabinet surface.

1. Be sure you are generous on this latter point. A modern refrigerating machine will do a lot of work if it has an adequate coil, but it will struggle painfully if the coil surface is inadequate. Furthermore, plenty of surface on the coil assures freedom from ruinous dehydration of the products. There is no such thing as "too much low side" provided you can shut the bunker door after you hang it in.

2. If the manufacturer rates the machines and coils in B. t. u., multiply the ice demand of your cabinet by 144, which reduces it to B. t. u. demand.

It will be noticed that the above calculations apply only to coolers and refrigerators with insulated walls on all sides. In practice, very little error will be introduced if the area of double or triple glass doors is ignored when the doors constitute 10 per cent or less of the total surface.

Cabinet Construction



If either of these sheets is used in the construction of a refrigeration cabinet the entire surface, inside and out, is protected against accelerated corrosion because the sheet is protected with Spelter (zinc) which is fused to the base metal by the Hot Process and immediately Heat-Treated, forming a zinc and iron alloy coating.

Booklet on Request

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(136)

Early Maryland Settler Invented Refrigerator

Washington, D. C.—One of the most distinguished of the early settlers of the Sandy Spring, Md., neighborhood was Thomas Moore, inventor of the first refrigerator, according to a recent article in the *Washington Star*. This Quaker was the son of Thomas Moore, of Ireland, who first settled in Pennsylvania early in the last century and later moved to Waterford, a small town in Virginia, which he named for his native town in Ireland. The village, situated about six miles from Leesburg, Va., is often visited as one of the early settlements of the Old Dominion.

Moving to Sandy Spring about 1794, after his marriage to Mary Brooke, daughter of Roger Brooke of Brooke Grove, Moore started farming on the estate of his wife. He made valuable contributions to agriculture and many visitors traveled to his model farm.

It was at this time that Thomas wrote a book called "The Great Error of Agriculture Exposed, and Hints for Improvements Suggested," published in 1801. A copy is contained in the Library of Congress.

A chapter in the book advocated deep plowing, which made the author a pioneer in this manner of farming.

The patent on his refrigerator, which Moore received in 1803, was signed by Thomas Jefferson as President and James Madison, Secretary of State. It is in the possession of the Misses Millar, of Alloway, granddaughters.

This first refrigerator is described as a small oval tub, 18 or 20 inches deep, in which was placed a tin square, holding about 22 pounds of butter. Between the wood and tin box was left a space

for ice, the whole being covered first with rabbit skin and then a coarse woolen cloth.

It being the habit to go to market on horseback, Moore invented the first refrigerator so that butter might be carried the 20 miles to Washington. He could deliver his butter in much better shape than the other market men. Later he made his refrigerator larger and in a different style for family and dairy purposes.

President Jefferson and some of the heads of the Government departments in Washington used Moore's patent refrigerator if they were fortunate enough to possess ice houses, which were luxuries in those days. After 14 years the patent expired, when the inventor gave the public the benefit of his work by not renewing it.

Moore wrote on many subjects, and his agricultural work made him widely known throughout Maryland. Also, as a civil engineer, as he was called upon by the corporation of Georgetown to build the causeway to connect Annapolis Island to Virginia, for which he was paid the sum of \$24,000. Then the United States Government employed him to lay out the great National road to the West.

President Jefferson later appointed him chief engineer of the James River Canal, and he also served in the same capacity for the Chesapeake & Ohio Canal. With his two brothers-in-law, Caleb Bentley and Isaac Briggs, he started a cotton mill at Triadelphia, Md., and at one time he managed the Union Manufacturing Mills, near Ellicott City, Md.

KELVINATOR MAKING CONDENSER STUDIES

(Concluded from Page 1, Column 4)
In the evaporator loaded the refrigerating equipment. The apparatus included two calibrated liquid receivers, one to supply refrigerant, the other to receive it from the tested condenser, so that accurate measurement could be made of the refrigerant condensed in any given test.

One, two and three-row condensers were tested, all built according to dimensions and specifications shown in the adjoining figure.

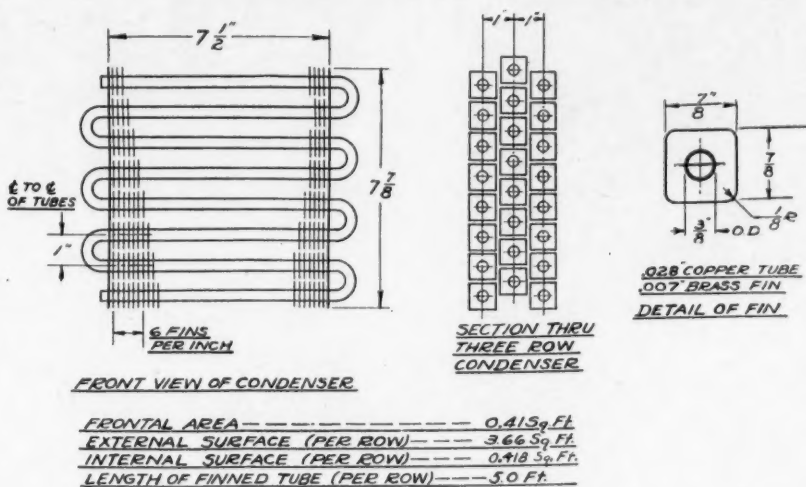
In order to study the performance of condensers under actual operating conditions, another test set-up consisted of an unshrouded fan placed alongside of the condenser, in the conventional operating layout.

The anemometer readings in this test showed that the air velocities were greatest near the outside of the fan, Mr. Scullen said. This was due, he explained, to the fan blades having the same angle along their entire length, and since the linear velocity of the blade was largest at the outside, the air velocity was also greatest there. The addition of rows to the condenser tended to lower the outside air velocity, and increase the center velocity.

The amount of air flowing over the condensing tubes is an important factor in maintaining condenser capacity, he stated. Adding more rows of tubes, he pointed out, does not increase capacities in an equal proportion, he pointed out, because the air flow is hindered by the additional rows. Thus a two-row condenser with other conditions kept the same, produced only 54 per cent more condensing capacity than a one-row, while a three-row condenser has only 85 per cent more capacity than a one-row condenser.

However, when the fan output is raised enough to produce the same air velocity through a multiple row condenser as with a single row condenser, the capacity of the two-row unit increases 20 per cent, and a three-row increases 40 per cent over its respective

Kelvinator Test Condenser



Size and specifications of test condenser used in the Kelvinator experiments described by Hugh Scullen in the Detroit A. S. R. E. meeting.

capacity with the same air flow.

In the discussion which followed his talk, Mr. Scullen showed that the capacity of air to pick up heat is increased but very little by increased air humidity. Many installers of commercial equipment are deluded into thinking that equipment in their climate requires special condensers. A condenser designed for a given machine should perform properly with it, regardless of the climate in which it is used, he claimed.

A.S.R.E. SPRING CONVENTION PROGRAM IS ANNOUNCED

New York City—The program of the 18th spring meeting of the American Society of Refrigerating Engineers has been partially announced by headquarters of the society here. The sessions will be held in the new Kansas City Athletic Club, May 6, 7 and 8.

The tentative program outlined follows: Wednesday, May 6—9 a. m., regis-

tration; 10 a. m., first session; 12:45 p. m., welcome luncheon; 2:45 p. m., automobile tour of Kansas City; and 8:30 p. m., stag smoker followed by buffet supper. Theatre for the ladies.

Thursday, May 7—10 a. m., second session; 12:30 p. m., council and committee luncheons; 12:30 p. m., ladies' luncheon and bridge in the athletic club; 2:30 p. m., golf tournament at the Indian Hills Golf Club; and 7 p. m., banquet, entertainment and dance.

Friday, May 8—10 a. m., third session; and 2 p. m., inspection trip to oil refineries, cold storage plants, ice plant, bakeries, candy factories, packing houses, as selected by individual guests.

The entire roof garden of the Kansas City Athletic Club, which is enclosed and heated, will be set aside for the use of the conventioners.

Reduced railroad rates have been secured for those attending the convention, and arrangements made for parties from New York, Philadelphia and Pittsburgh to use the Pennsylvania, leaving New York the Monday before the convention.

Lindsay Explains Surface Resistance Effects in Refrigerator Insulation

By Harvey B. Lindsay, President, Dry-Zero Corp.

The insulating value of a material is principally dependent upon the number and value of the surface resistances it opposes to the line of heat transmission, modified by its value of conductivity.

(Editor's Note: Since this theory of specific surface resistances was proposed by Mr. Lindsay several years ago, it has come to be known as the "Lindsay Theory.")

The term "surface resistance" has been generally used in heat insulation, to describe the effect on the passage of heat, of convectional disturbances in free gas near a solid surface of different temperature, in the path of heat transmission. As this is rather a function of the gas than of the solid surface, I suggest that some such term as "marginal disturbance" should be used for it.

In analyzing the passage of heat through the interstitial or cellular body of an insulant, the discussion is much simplified if we use "surface resistance" as applying to the inherent resistance offered by a solid surface *per se*, contiguous to a body of air or gas, whether small or large, confined or free.

Therefore, for the purposes of this paper, "surface resistance" is to be considered a function of the surface of the solid itself (exposed to gas) internal of the body or external.

Whether in the cell of cork, the fine tube of Dry-Zero, or the interstitial areas between the fibres of Dry-Zero, of air, or other fibrous or pulp insulants, the air itself is far from "dead" as to performing its natural functions of conduction and convection or permitting radiation. It is safe to say that in each such subdivision there is so vast a number of free, constantly and rapidly moving gaseous atoms or molecules as to preclude any practically measurable depreciation in their heat conveying activity.

Although this fact seemed obvious, I

checked it up with a number of simple experiments, for example:

A cubical block of a light wood having an elongated cellular structure, shows a very marked difference between its insulating value when tested across the grain and that shown with the grain—yet the contained air and the total conductive value are unchanged.

For such reasons and others, less obvious but of equal force, we face the conclusion that with a relatively great number of gaseous particles in these apparently small spaces, all in perpetual and active motion, and free to function as usual in the aspects of conduction and convection, and with radiation across these air spaces in no unusual way impeded, we must look elsewhere than in the air alone for the principal impediment offered by insulating materials to heat flow.

In the effort to analyze the principal cause of heat retardation in an insulating material, I found it necessary to bring to the task as competent a picture as possible of the movements and activities of the gaseous particles (atoms or molecules) in the air subdivisions within the insulant, when under the influence of heat flow. Here are the chief outlines of that picture, a cell being taken for simplicity's sake:

A wall on one side of higher temperature than that on the opposite side; an immense number of freely, rapidly and constantly moving gaseous particles; these particles striking the walls, rebounding, "colliding" with each other; the entire population of particles in a revolution, up the warm side and down the cooler—a very lively picture for an "inert" subject!

Now the atom or molecule of matter manifests heat in the form of motion, presumably somewhat complex in its nature.

In the gaseous form at normal pres-

(Concluded on Page 8, Column 4)

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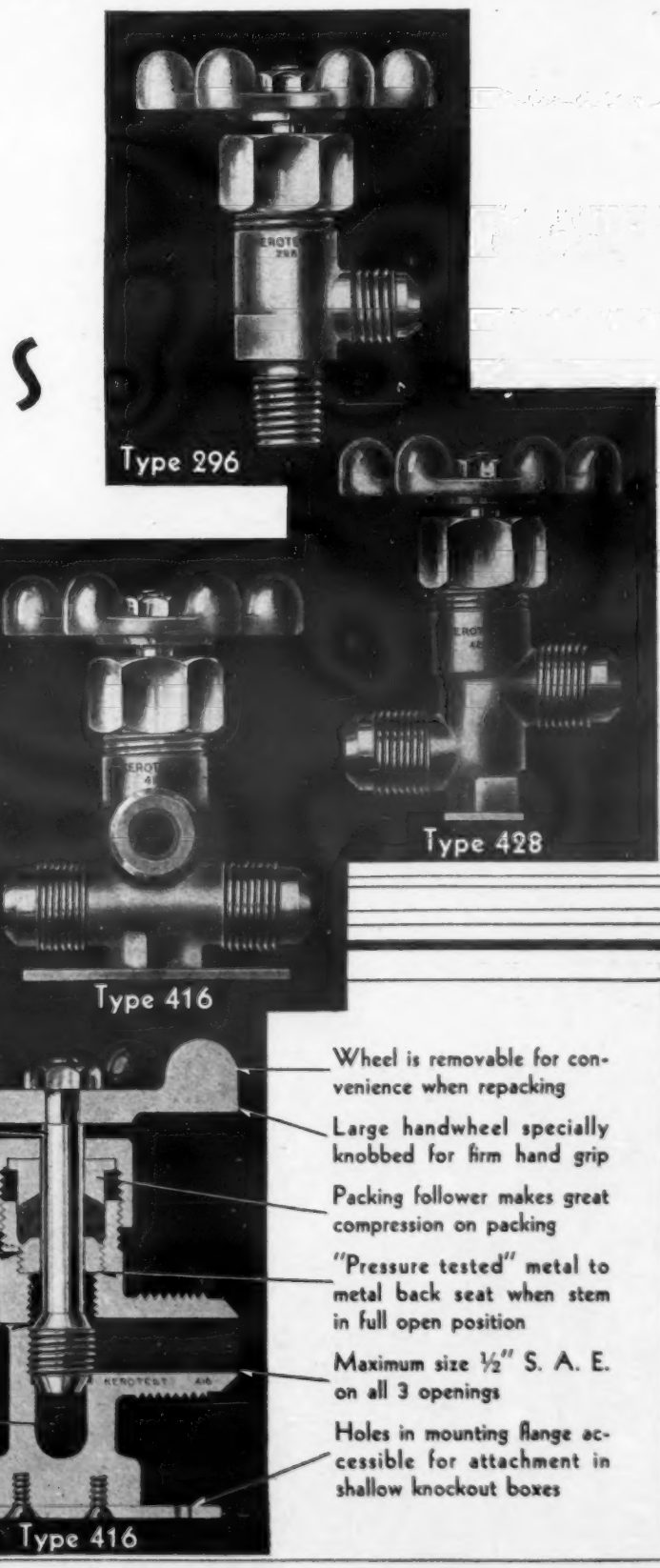
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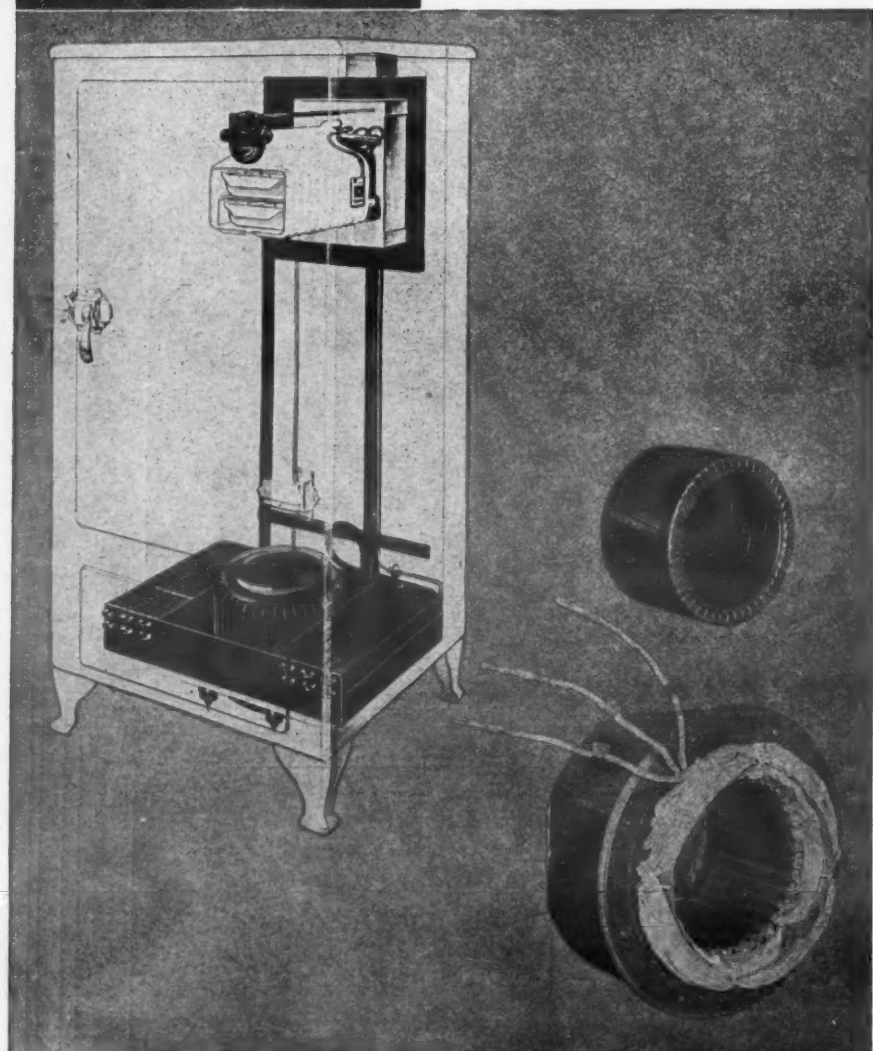
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and some fifteen years of close co-operation with the manufacturers of mechanical refrigerators, has specially insulated wire, special coil and slot insulation, and even special soldering flux so that no reaction with the refrigerant gas can possibly take place. The rotor is dynamically balanced for vibrationless performance. No detail has been overlooked in making this motor trouble-free, quiet and long-lived. > > > The choice of Wagner for refrigerators attests to the Wagner motor's pre-eminence in the refrigeration industry.

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SERVICE HINTS

By FRANK W. GRAY

Direct expansion cooling coils with large enough surface area to be operated on an automatic defrosting cycle are coming more into use by refrigeration engineers. Such direct expansion cooling systems, operated with automatic expansion valves, are used in display counters, back bar installations, and even in large meat coolers.

When freezing coils of the direct expansion type are assembled in the service shop, finned copper tubing, with its surface tin-plated or galvanized against oxidation, will be found very much efficient. The surface area of the finned tubing is so great that defrosting is facilitated.

The finned tubing will also be found efficient in brine cooling unit installations.

The problem of fog or condensed moisture forming upon the glasses of display counters often presents itself when such cases are electrically refrigerated. Fog or condensation of moisture occurs when cold air comes in contact with warm air. If display cases with multiple glasses are to be refrigerated to a low temperature, the air spaces between the glasses must be sealed against any influx of warm air. Otherwise, a fog will form between the glasses.

Some showcase manufacturers use a large rubber gasket into which the edges of the plate glasses are sealed. In the case of an old-type display counter with poorly set glasses, rubber gaskets or cement should be used to seal the margins of the glasses against air leakage.

Another cause of such condensation is where the freezing coil is allowed to come into contact with a portion of the glass. This causes a sharp difference in temperature between areas of the glass, which develops condensation or fog even in an air space sealed against leakage from outside.

Service engineers seem peculiarly susceptible to the temptation of undertaking eccentric installations. And salesmen often like to sell such installations, allowing the service department to shoulder the grief. Such jobs as electric refrigeration installations on automobile trucks, yachts, ice cream fountain conversions, window displays of peculiar specifications, and other hybrid installations are usually undertaken for glory but seldom yield profits.

The service risk is too great and the labor cost too high. The consistent profit in electric refrigeration comes from the sale of standardized equipment which can be easily installed by proven methods, not from trying to work miracles with coils and compressors.

Whenever it becomes necessary to install jobs of eccentric specifications, a high price should be charged to cover the additional installation work which will invariably be required, and the job should be sold subject to no free service guarantee.

When installing multiple apartment house systems, using either methyl chloride or sulphur dioxide, service men will find that $\frac{1}{4}$ in. copper tubing may be used with perfect satisfaction for the suction line connection between the refrigerator cabinet and the vertical suction line riser which follows up the walls of the building. From $\frac{3}{8}$ to $\frac{1}{2}$ in. copper tubing is used in the main suction line risers, this large size tubing being, of course, necessary for the longer runs.

But the comparatively short connecting lines of tubing from riser to box may be much more easily and quickly installed with the pliable and easily handled $\frac{1}{4}$ in. tubing, using a $\frac{3}{8}$ in. or $\frac{1}{2}$ to $\frac{3}{4}$ in. flared tee in the riser, and $\frac{1}{4}$ in. suction line flared couplings on the cooling coils.

Service men sometimes find themselves obliged to place a compressor at a higher level than the freezing coil or coils. With a direct expansion methyl chloride system this is entirely practicable, since methyl chloride operates under normal conditions with a suction line pressure which insures the return of oil to the compressor.

With sulphur dioxide systems, however, there is a danger, even when using direct expansion, of oil logging in the lower levels of the coils unless some special designing is done to prevent this. One method of providing for the return of oil with a sulphur dioxide flooded system is to use the pan-type of float fitted with a small tube to suck out surplus oil.

Even when this oil-return device is used, however, there is apt to be a knocking in the machine just before it shuts down, due to the oil passing back in slugs. It is better not to take a chance with the overhead placement of a sulphur dioxide machine unless factory engineers have designed a system especially for this inverted position.

After all is said and done, the best installation for display counters is a direct-expansion overhead coil with large surface area, fitted into an insulated compartment at the top of the case, and baffled underneath with a drip pan to direct the air circulation up the sides and down the middle.

A variation of this installation is to run secondary levels of coils in the form

of shelves underneath when the display counter is of full height. Display counters can easily be built to accommodate such an installation, and the results of long experience have shown the direct overhead installation of coils to be much more satisfactory than coils placed in the rear of the case.

Three methods are commonly used for the installation of salad counters in restaurants. The first method is the old "ice pond," which is simply a cake of ice frozen above refrigerated coils submerged in sweet water. The difficulty with the "ice pond" installation is that the machine must run most of the time to keep the ice frozen, and through a constant thawing on the surface and freezing underneath process the dishes freeze into the ice so tight that they are not moveable, while the surface of the ice may become coated with particles of food, making the entire installation messy and unsanitary.

The second commonly-used method is to run direct expansion cooling coils under a metal plate, forming a covering of frost on the plate and placing the dishes thereupon. This method, while less messy than the "ice pond," has similar drawbacks. The dishes are apt to freeze to the metal plate, and the heat leakage is so great that the machine must run most of the time.

The last method, and the best of all, is to construct a flat brine tank, about 2 in. in thickness and with length and width conforming to the specifications of the counter. Finned tubing is coiled into this tank, which is filled with brine, and connected to an expansion valve or boiler, as the case may be. The flat brine tank is then sealed into a cork insulated base, with only the upper surface of the tank exposed.

A Monel metal shield, with round beveled holes into which the dishes are set, is then fitted over the top of the counter, with a clearance of an inch or two above the frosted surface. Such an installation imparts the refrigeration directly to the salad dishes without the excessive heat leakage which causes constant operation and bothersome surface freezing.

An instrument which shows the relative humidity content of the air may be purchased for a nominal sum, and is a valuable addition to the service equipment. By the use of this instrument a service man can quickly test the dehydrating effect of a cooling unit installation. Humidity content in the air bears an important relation to efficient refrigeration, and should not be left entirely to guesswork.

The writer recently saw in a service shop a convenient method for handling ten-gallon steel oil drums. When such drums are tipped up by hand to drain the oil into smaller containers, the drums are found clumsy and heavy to handle, and some of the oil is usually spilled in the process.

In this instance two large blocks of wood were bolted to the bench, about 12" apart. Four steel casters were set into these blocks at such an angle that the oil drum, resting upon these casters, could be easily rolled into the required position for draining oil from the outlet plug in the end without losing any oil.

One frequent reason why service departments are a source of loss to the refrigeration dealer is due to the poor methods of keeping of service records and inventory cards. Service men are prone to be careless about the handling of inventory.

It is a simple matter to devise a perpetual inventory card system whereby all items of service stock, such as flared fittings, machine parts, etc., may be counted daily, and replenishments or withdrawals recorded.

The service man should be required to fill out an order for any item withdrawn from stock—however small it may be. These orders may then be checked against the proper job, and entered on the inventory cards daily by the bookkeeper.

Large machines installed to operate commercial or apartment house jobs should be shielded. Woven wire screens can be made very cheaply, and may be bolted, or even padlocked, over the compressor. This shield protects the machine from damage or interference.

Several cases are on record of children catching their fingers in revolving belts or fly wheels. This means a damage suit. It has often happened when compressors are installed in basements that rats or mice have been caught in the belt pulleys, causing a temporary shut-down.

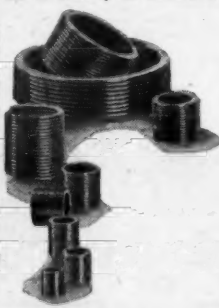
Most important of all, a shield protects the compressor from well-meaning but inexperienced persons who frequently try to improve upon the adjustments of the mechanisms.

Why

You Should Investigate Thermo- electric Controls

Adjustable for range and differential—built with both direct connected bulb and capillary tube remote bulb—adaptable to horizontal or vertical mounting—actuated by the B & B Multiflex Bellows. Thermoelectric refrigeration controls also include cold adjustment and defrosting mechanism in a single device. • Investigate. For consultation about your control requirements a complete engineering staff is at your disposal, gratis.

The B & B Multiflex Bellows. A feature of B & B specialties, used for years on a variety of different controls.



Send for the Thermoelectric Bulletin

The Bishop & Babcock Sales Company

4901-4915 Hamilton Ave.

Cleveland, Ohio

DETROIT SERVICEMEN OPERATE FROM HOME

Detroit—By operating their independent service company from the same building in which they live, J. W. Downs and G. C. Murphrie who conduct the Electric Refrigerator Service under partnership arrangements, are able to maintain 24-hour service without keeping a man on telephone duty all night.

"Naturally," Mr. Murphrie remarked, "we are not anxious to dash out in the middle of the night to make minor adjustments, but any bona fide need for immediate service, such as a gas leak, will be attended to right away."

A new two-flat brick building is the scene of their activities. Both partners are married, and have cute youngsters, the Murphries using the upper flat, and the Downs the first floor. The basement houses the "shop." The ladies are both very interested in the business, and are helpful in keeping the calls accurately recorded in their call-book.

Most of the service work can be done right in their customers' homes, according to Mr. Murphrie. However, when a domestic refrigerator needs to be taken to their shop, they have a truck for that purpose.

A sizable portion of their business comes from commercial refrigeration users when these people need additions or changes in their equipment, and when they are moving to new locations. Since the Detroit ordinances have been made more strict, all installations are made in complete compliance with them, Mr. Murphrie stated.

They have an agreement to service and install all ice cream cabinets for the Gold Medal Ice Cream Co., and are taking care of service on all refrigerators of Rice Products which were sold within the guarantee period.

Service charges are based on a time and material basis. Parts are sold at

Service Manager



E. D. Madden has been appointed service manager of Delco Products Corp., according to B. D. Kunkle, president. Mr. Madden has been connected with the company for seven years, and was assistant service manager since 1929.

list prices, and labor charged at the rate of \$1.75 per man hour. A minimum charge of \$2 per call is made. A parts stock approximating \$3,000 is maintained on their shelves at all times, according to Mr. Murphrie.

Mr. Downs had experience in Frigidaire and Kelvinator service departments, and Mr. Murphrie serviced Kelvinator and Copeland machines before October, 1929, when they organized their present enterprise.

FRIGIDAIRE IS USED FOR TESTING PAPER

Adams, Mass.—Electric refrigeration is used in the laboratories of the L. L. Brown Paper Co., of this city, for the testing of paper manufactured by them. L. R. Sweatland, Inc., of Pittsfield, Mass., installed the equipment, using a Frigidaire Model C 1½ h. p. compressor operating two 20-F coils.

The machinery is operated in an insulated room, 18 by 14 ft., having a constant temperature of 75 deg. F. and a relative humidity of 50 per cent. A duct and blower system are employed to maintain uniform conditions throughout the room.

The refrigeration plant is attached to an outer wall, in direct connection with the main duct, and the use of thermostats and humidistats keeps the situation in control at all times, a complete change of air being effected every 10 minutes. The installation replaces an old water system that was more expensive to operate.

N.A.P.R.E. WILL DISCUSS REFRIGERATION IN DAIRIES

New York City—Refrigeration in the dairy industry will be discussed by members of the New York section of the National Association of Practical Refrigerating Engineers in their next meeting, April 2, in the Engineering Societies Building.

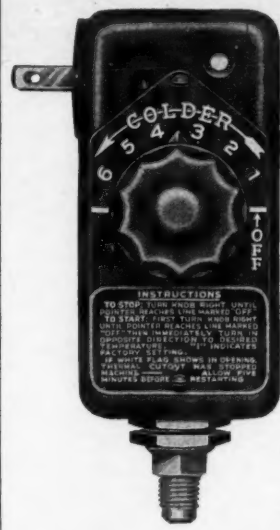
A representative of the Creamery Package Co. is expected to lead the meeting. Clifford Holske, of the American Ice Co., will discuss questions in the N. A. P. R. E. Question Box.

The following meeting will be held May 7 in the same place.

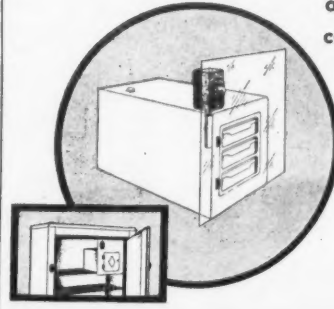
FOR DOMESTIC ELECTRIC REFRIGERATION

PENN TYPE 'J' UNIT CONTROL

One Dial Control . . . Convenient Mounting



The demand for beauty and new conveniences in automatic controlling devices for domestic electric refrigerators finds response in the Penn Type J Unit Control. It has been designed so that if desired only the attractive black and white dial plate need appear. (See simple mounting illustrated.) The movement of the dial in a half circle not only starts or stops the unit, but also gives six colder temperature settings, and in addition resets the motor protective device after it has operated. Thermal overload protection to safeguard the motor is incorporated in the case as well as convenient adjustments for changing range and differential. No other control offers so many outstanding advantages in one compact instrument. Write today for complete specifications.



PENN ELECTRIC SWITCH CO.
DES MOINES, IOWA

New York City, Cincinnati, Ohio, Milwaukee, Wisc., Seattle, Wash., Boston, Mass., Detroit, Mich., San Francisco, Cal., London, England, Philadelphia, Pa., Chicago, Ill., Los Angeles, Cal., Barcelona, Spain, Osaka, Japan, Lyons, France.

Overheating of Compressor Is Usually Caused By Four Remediable Conditions

A COMPRESSOR will heat up to a certain extent under ordinary operation, but when its temperature becomes excessive the trouble can usually be traced to one of four definite causes, and remedied, according to engineers of the Williams Oil-O-Matic Heating Corp.

"Excessive pressure and overheating of the compressor unit may be caused by any of the following four difficulties: air in the system, an overcharge of methyl chloride, a dirty condenser, or inadequate ventilation."

"Air in the system causes excessive pressure, but not necessarily marked overheating," the Williams engineers state. "In most cases, air in the system is caused by improper purging. However, air may be introduced in the system through a leak in the low pressure side when the compressor pumps a partial vacuum."

"Under normal operating conditions, even the extreme temperatures required for an ice cream cabinet do not require a partial vacuum in the low side of the machine. But a partial vacuum will be pumped if the float valve in cooling unit should remain stuck closed, the methyl chloride pumped back into the liquid receiver, and the machine kept in operation."

"Air in the system collects in the dome of the compressor. It may be purged by closing the suction and shut-off valves,

and loosening the plug in the discharge shut-off valve for from five to ten seconds. The plug should then be tightened, the valves opened, and the machine may be started."

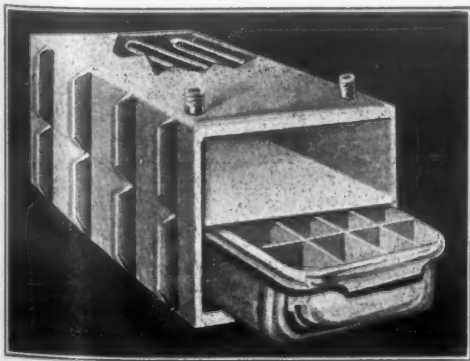
"The second trouble listed, the presence of an overcharge of methyl chloride which reduces the condensing space, can be remedied by discharging part of the refrigerant into an empty service drum."

"A dirty condenser sometimes results from dirt and lint collecting on the outside surface of the condenser. When this accumulation reaches a point where air circulation is seriously restricted, the reduction in capacity will cause compressor heating and high head pressure. This can be fixed by brushing the external surfaces of the condenser briskly with a stiff brush, or blowing them with a bellows."

"If the room in which the compressor is installed is comparatively small and does not have adequate ventilation, the result will be that the heat dissipated by the compressor will raise the temperature of the room appreciably. This in turn lessens the efficiency with which the heat is dissipated from the condenser, and results in excessive pressure."

"The remedy for this is simply to increase the ventilation of the room. Possibly a panel or two may be removed from the door, or a window may be left open to afford adequate ventilation."

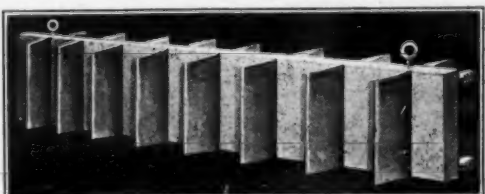
Snowy White Porcelain Enamel



As Low As \$3 Per Tray Opening

Some three years ago we introduced our novel expansion cooling unit containing an embedded coil cast in a metal wall thereof as covered by Patent No. 1,706,621 (re-issue pending). Now we offer the trade an even lower priced unit in vitreous porcelain enamel of radically different construction but of high efficiency, at a considerably lower price, the same being covered by basic claims allowed in pending patents. Manufacturing sub-licensees to larger manufacturers will be entertained.

Mechana-Kold Corp.
BABYLON, N. Y.



Show Case Slab

Comparative studies show Brass cheaper for most screw machine products

A GREATLY increased rate of production due to the superior machining qualities of brass, together with the high salvage value of brass scrap, serve in the majority of cases to bring the total cost of producing a given piece in brass well below that of production in steel.

The following examples illustrate the production increase with brass and consequent cost reduction in three typical cases.

PIECE	PRODUCTION		COST REDUCTION
	Brass	Steel	
per machine per day			per M pieces with brass
Filler Cap	4100	800	37.8%
Retaining Nut . .	2000	176	35.5%
Valve Clapper . .	1350	300	7.5%

Increased production and high scrap value are but two of the reasons why scientifically alloyed Anaconda Free-Turning Brass Rods are rapidly receiving recognition from leading manufacturers as the best all-around material for the manufacture of screw machine products. Complete information in Publication B-14.

For screws, bolts, valves and other parts in contact with acids or refrigerants, Everdur* is used to advantage. It is an exclusive Anaconda alloy of copper (96%), silicon and manganese, combining the strength of steel with extreme corrosion-resistance. Further information is contained in Publication E-2, sent on request.

*Trade-mark Reg. U. S. Pat. Off.

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ANACONDA
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ENGINEERING SECTION ELECTRIC REFRIGERATION NEWS

The Business Newspaper of the Refrigeration Industry

Published by

BUSINESS NEWS PUBLISHING CO.

550 Maccahees Building, Woodward Ave. and Putnam St.
Detroit, Michigan. Telephones: Columbia 4242-4243-4244

Subscription Rates:

United States and Possessions: \$2.00 per year;
three years for \$5.00

All other Countries: \$2.25 per year; two years for \$4.00
Advertising Rates on Request

F. M. COCKRELL, Publisher

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VOL. 5, No. 15, Serial No. 117, Part 3, March 25, 1931

Display Case Design

IMPROVEMENTS in the construction of refrigerated display cases are significant examples of design to meet the needs, not designing purely to sell. New thought in design practice comprehends the necessity of developing equipment which will properly do the job for which it is intended.

Early display cases were little more than wood boxes with windows. Lack of adequate insulation meant the temperature difference between the outside and inside air was small, with resulting deterioration of the food contained.

Then food experts began to postulate their views that well regulated, constant, and lower temperatures are necessary to preserve perishable provisions. Humidity and temperature must be right for each food which the storekeeper means to preserve, they said.

This fired the designing engineers to provide sanitary display cases which would furnish the conditions needed. Among the multifarious problems involved were providing air circulation to all parts of the case, finding good insulation and fabricating it in airtight construction which would hold the temperatures, keeping the humidity correct, installing refrigeration equipment which would not allow temperatures to go too high in defrosting, insuring clear vision of the food for sale, illuminating the cases without introducing too much heat, and appointing the cases with attractive hardware and finishes.

These, and many other needs have been taken into consideration by the designing engineers. The number of times a case is opened by the average shopkeeper is being investigated, and usage factors studied for different classes of service. The amount of heat introduced in placing more food in a case is known, and allowed for. Heat losses of a complete case can be determined, and the necessary compressor size figured.

The class of service is an important factor in furnishing a display case. They are furnished for the special needs of meats, butter, cheese, fruit, vegetables, fish, quick-frozen foods, delicatessen and flower shops.

The designers' aim has been to furnish display cases which will provide preservation conditions in dependable, economical equipment, requiring little attention from the merchant.

Service Information

IN line with the new policy of refrigerator manufacturers of being more liberal with information on the maintenance of their machines, the Absopure Refrigeration Corp. has started a service plan that should be effective for any company which does not have authorized service men in many parts of the country.

With every domestic refrigerator sold, a booklet is included giving installation instructions, suggestions to the customer on care of the machine, and pointers which will help any service man who might be called in to make adjustments.

Thus a service man can tell without experimentation just where each element is, and what special characteristics of the machine he should know before

beginning any work on it. In addition, the installation will be made properly, for the installer is furnished with complete instructions.

Engineers and Enthusiasm

ENTHUSIASM is an admirable quality in an engineer. Manned largely by industrious young men, the electric refrigeration industry reflects the enthusiasm of engineers who are convinced that the future promises interesting and profitable advancement.

With large universities offering refrigeration courses, the time has come when college students prepare definitely for the profession of refrigerating engineer. They become trained men of a single aim—to direct the engineering activities of a well-defined industry. They start with no pre-conceived notions gathered in other technical fields. They are enthusiastic.

The large number of patents issued to individual inventors each year testifies to the enthusiasm of that group. The fact that many are never applied in profitable enterprises does not detract from the collective value of their owners' zeal. Their ideas have had an inestimable influence in the progress of industry.

The research engineer is usually marked by a critical attitude toward everything he sees or hears. He even questions laws and data which have been accepted in scientific circles for many years. He will use figures and information with equanimity only when he knows how they were gathered, who prepared them, and why they were collected. Not knowing these facts about a body of statements, he will make up his own on the basis of actual experiment.

In utilizing the data, he then bears in mind the qualifications, and kinds and degrees of error which may affect it. His doubt pervades the entire experiment—enthusiasm appears when he feels his conclusions are correct and valuable.

On Our Bookshelves

"SHEET STEEL AND TIN PLATE"

Author: R. W. Shannon. Publisher: The Chemical Catalog Co., Inc., 419 Fourth Ave., New York City. Pages: 285. Price \$5.

Written in language which an engineer entirely removed from the steel industries can readily understand, this book offers a practical knowledge of sheet steel and tin plate with the uses, limitations, and advantages of the various grades and finishes.

The first 40 pages are devoted to brief descriptions of the iron and steel processes which precede the rolling of the metal into sheets. The author traces the path of iron ore through the blast furnaces to pig iron; from pig to cast iron, puddling furnace, open hearth furnace, or the Bessemer converter; from the open hearth furnace and Bessemer converter to steel castings, the forge, and rolling mills. It is the rolling mill which produces the sheets.

Rolling, he defines, as "the passing of a piece of metal, either heated or not, through compressing rolls for the purpose of changing its shape or properties." Most rolled steel products receive their preliminary shaping from hot-rolling. Since this leaves the sheets more or less stiff and brittle, not always flat, and with their surfaces oxidized and somewhat rough, various refining operations follow such as annealing, cold-rolling, pickling, galvanizing, tinning, etc.

"Since practically all sheets are used for purposes requiring them to be more workable and flatter than they generally come the hot-rolling, most sheets must go through ordinary annealing and flattening operations after the shaping process," he writes. These operations he terms "ordinary refining" because they are included in the price of the common, basic sheet steel grades.

The pickling process, familiar to refrigerator manufacturers as necessary before enamel is applied, is also part of the treatment of galvanized sheets tin plate, terné plate, and other special finishes. This operation serves to remove oxides and scale, and roughens the steel so that the enamel will adhere. The writer explains resquaring, flattening operations, and oiling. In a following chapter he treats protective coatings: oiling, liming, bluing, painting, galvanizing, terné plate, and tinning.

In a group of valuable appendices, he defines terms and abbreviations, tells how to specify sheet steel products, and explains tolerances, gage weights and thicknesses as recognized in the industry. The volume is attractively prepared, interestingly written, and should be valuable to the many engineers who use sheet metal.

Letters from Readers

Change in Name

120 West 18th St.,
New York City.

Editor:

Thank you very much for including us in your list of independent service companies.

We have, however, one correction to make, and it's our fault that it is necessary. Some six weeks ago we changed our name from Electric Refrigerating Service Co. to Independent Refrigeration Service.

Since this new name is to be our permanent designation, we will appreciate your making this correction.

Victor Hirshfield,
Independent Refrigeration Service.

Motor Pulleys

Burlington, Wis.

Editor:

On page 12 of the *Engineering Section* Mr. Gray states that replacing motor pulleys with larger pulleys will slow up compressors which are too large for efficient operation.

We think that this is in error and should read *smaller pulleys*. We have had occasion to slow up one Kelvinator Heavy Duty condensing unit. We did this by using a smaller pulley made up especially for the job in a local machine shop. The former size was a 5 in. pulley, and the new pulley was a 3 in. size.

Please add our name to your list of independent service companies.

Leonard R. Partee,
Burlington-Kelvinator Co.

Big Help

21 William St.,
Fords, N. J.

Editor:

Just a few lines to let you know that we have established an up-to-date shop for service on all makes of refrigerators.

Your *Engineering Section* of the *ELECTRIC REFRIGERATION NEWS* will be a big help to all independent service companies.

A. R. Lind,
Refrigeration Service Co.

Great Interest

Indianapolis, Ind.

Editor:

We have received our first copy of your publication, and are sure it is going to be of great interest and assistance.

J. N. Browncombe,
General Refrigeration Service.

Small Unit Data

Bronx, N. Y.

Editor:

I am interested in small commercial plants and household units. Do you happen to know of a school or such where I can get information along these lines, located here in the East?

Frank H. Adams,

Welcomes New Section

Milwaukee, Wis.

Editor:

It is with pleasure that I congratulate you upon the publishing of the excellent *Engineering Section*. Expressing the sentiments of many hundreds, who have been looking to *ELECTRIC REFRIGERATION NEWS* as the only medium of their profession, I will state that this is the section which we hoped for and now realized.

In keeping with your unbiased policy, it will no doubt be a pleasure to look forward to this section as a medium to-

ward better engineering of the new refrigeration industry and its related problems of service and installation.

This ideal combination of the three sections leaves nothing to be desired, and the phases now covered should be an ideal inducement to all who are connected with the refrigeration industry.

Henry H. Hauer,

Looking for Parts

2 North Grand Ave.,
Poughkeepsie, N. Y.

Editor:

In answer to your invitation to have the independent service companies send in their names for the list that you are now publishing in the *News*, we wish to have our name placed on that list of the next issue.

Also we wish to know that if there are any refrigeration jobbers who can supply us with replacement parts for all models and manufacture of machines. It is quite a problem for us Contractor of Refrigerating Machinery, to obtain replacement parts, and we would appreciate it very much if you would give us names of jobbers who can give such a supply. At present we see no advertisement of jobbers in the *News*.

Joseph J. Ghee,
Ghee Bros. Electric Service.

'I Want to See More News About'

Commercial installations—L. H. Judge, 2140 Morrison Ave., Rocky River, Cleveland, selling Jewett refrigerators.

Where to buy material—R. E. Kendall, Kendall's Electric Refrigerator Service, 402 Cutler St., Raleigh, N. C.

Mechanical details and information of the different makes of electric refrigerators—G. R. McLay, 829 W. 75th St., Los Angeles, serviceman with Frigidaire Sales Corp.

Refrigerants—George Van Antwerp, 209 E. Ogden St., Milwaukee, Wis., with Berns Appliance Co. of Milwaukee.

Progress of manufacturers, and of frosted food industry—Lloyd W. Wymons, with Central Electric Co., 112 S. Washington St., Green Bay, Wis.

Apartment house installations—G. L. Anderson, 2616 E. 34th St., Kansas City, Mo., serviceman with Western Kelvinator Co.

Insulation—B. D. Franklin, 5 Brearwood Road, Charlotte, N. C.

Air conditioning—Lee Gollbart, 608 S. Cinn, Tulsa, Okla., with Lee's Refrigeration Service.

Educational data, technical calculations, service problems, absorption systems, silica gel—George C. Beardsley, 26 Sidney Place, Minneapolis, serviceman with Minneapolis General Electric Co.

More news about larger sulphur dioxide compressors—C. L. Billmeyer, 716 Buckbee St., Rockford, Ill.

Larger sulphur dioxide compressors—C. L. Billmeyer, Rockford, Ill.

Frigidaire—Charles M. Kronson, Pittsburgh, Pa.

Technical details of mechanism construction—A. J. Horn, Berkeley, Calif.

Comparative tests of competitive machines—Chas. W. Wilmes, St. Louis, Mo.

What the Majestic factory is planning for 1931—Edmond A. Dugre, Manchester, N. H.

Water coolers, commercial coils, and two-temperature controls—Edwin J. Kahle, Ottawa, Ohio.

Types and tests of fluid milk cooling units—Kansas Committee on the Relation of Electricity to Agriculture, Manhattan, Kan.

Coming Meetings, Conventions

American Chemical Society, eighty-first meeting, March 30 to April 3, Indianapolis.

Three-M-Congress, Management, Maintenance and Materials Handling Congress and Second National Industrial Equipment Exposition, April 13 to 18, in the Arena and Exhibit Hall, Cleveland Public Auditorium. Under auspices of the American Society of Mechanical Engineers, 29 W. 39th St., New York.

American Oil Burner Association, April 13 to 18, Benjamin Franklin Hotel, Philadelphia.

American Society of Mechanical Engineers, semi-annual meeting, April 20 to 23, Birmingham, Ala. Calvin W. Rice, 29 W. 39th St., New York City.

American Electrochemical Society, spring meeting, April 23 to 25, Hotel Tutwiler, Birmingham, Ala. Colin G. Fink, Columbia University, New York City.

American Institute of Refrigeration,

convention, April 30 to May 1, Ritz-Carlton Hotel, Atlantic City, N. J. Louis Baron, secretary.

American Society of Refrigerating Engineers, spring meeting, May 6 to 8, Hotel President, Kansas City.

National Electrical Manufacturers' Association, spring meeting, May 13 to 23, Hot Springs, Va. A. W. Berresford, 420 Lexington Ave., New York City.

National Electrical Credit Association, annual meeting, May 21 to 22, New York. Frederic P. Vose, 1008 Marquette Bldg., Chicago.

National Electrical Wholesalers' Association, spring convention, May 25 to 29, The Homestead, Hot Springs, Va.

Institute of Radio Engineers, annual meeting, June 3 to 6, Chicago. H. P. Westman, 37 W. 39th St., New York City.

National Electric Light Association, convention, June 8 to 12, Atlantic City, N. J. A. Jackson Marshall, 420 Lexington Ave., New York City.

STEEL MANUFACTURE AT ARMCO DESCRIBED

(Concluded from Page 1, Column 1)

limestone for his blast furnace, and every carload is inspected and laboratory tested as it arrives in the plant. If it doesn't meet the specifications, the enameling iron manufacturer can't use it.

Into the blast furnace it goes—the scrap, the coke, the iron ore, the limestone. Hungry flames leap high, and soon the charge is reduced to a soupy, boiling liquid. It splashes, moans, boils, worries, all the time passing off impurities. Pretty soon the liquid pig iron is ready to cast.

With a roar the freed metal gushes from the tap hole down the long clay runner into a waiting ladle capable of holding hundreds of tons. Again it seethes angrily, boils, and finally a certain amount runs over the top. Don't worry about that, however, for the spilled portion is only the impure slag rising to the surface.

But wait! There is a chemist at this blast furnace. Before that ladle leaves the furnace he has taken a sample, analyzed it and weeks later the man over at the shipping department can tell you, if you desire, the number of the cast, when it was made, its analysis, and all the pertinent facts.

Ladle on Railroad Tracks

This ladle of molten pig iron is mounted on railroad tracks. An engine backs in, and away it goes to a waiting open hearth furnace. A giant crane is waiting in the open hearth building. It slips quietly up, and gently lifts the ladle from its car.

No. 8 open hearth is roaring hungrily, a spout projecting from its inner parts. Deftly, the crane tips the ladle and out runs the fluid pig iron into the furnace. A signal, and away goes the empty ladle.

Look in the peephole a few hours later, and you will see a miniature Vesuvius in action. The metal is playing leap frog. It boils, and sputters, as the roaring flames of the furnace sweep over it. Another chemist appears on the scene. He takes sample after sample, and these are placed in small containers and shot to the laboratory through pneumatic tubes much like the sales lady in a department store sends your ten-dollar bill to be changed.

"It's ready" comes back word from the "lab" after the last sample has shown that the purity of the iron meets the rigid standards established. "She's ready, boys," shouts the veteran open hearth melter, "let's go."

Out gushes the metal from the rear of the furnace, into another giant cauldron. Another crane slings the 150-ton burden aloft and carries it to a long string of moulds. More fireworks, and soon the moulds are filled to overflowing with molten white-hot metal. Another engine backs in, and the miniature train of ingots, each weighing some 11,000 pounds, is towed outside the building to cool and solidify, before the mold casings are stripped off.

Up to this point, the enameling iron has been undergoing purifying processes. It is now ready for rolling.

Again giant doors roll back, flames spout forth and a nimble crane deposits each individual ingot into a series of surface furnaces called soaking pits, where each ingot "soaks" up a uniform heat.

Ingot Goes to Rolls

"She's hot," cries the soaking pit heater. Out comes the ingot, onto a long roll train to the blooming mill. "Will they ever get that monster ingot between those close-set rolls" you wonder. You close your eyes; it booms like a cannon! You open them in time to see the massive blooming mill rolls biting into the body of their victim. "Why that mill is almost human," you exclaim.

Back and forth it shoots the ingot, and then, like a dog shaking a cat, it flops the mass of iron over on its side, and again it zooms through the rolls. This blooming mill kneads the ingot much like the housewife kneads her biscuit dough, or the steam hammer clamps down on a forging. Soon the ingot is a slab, twenty feet long and four or five inches thick.

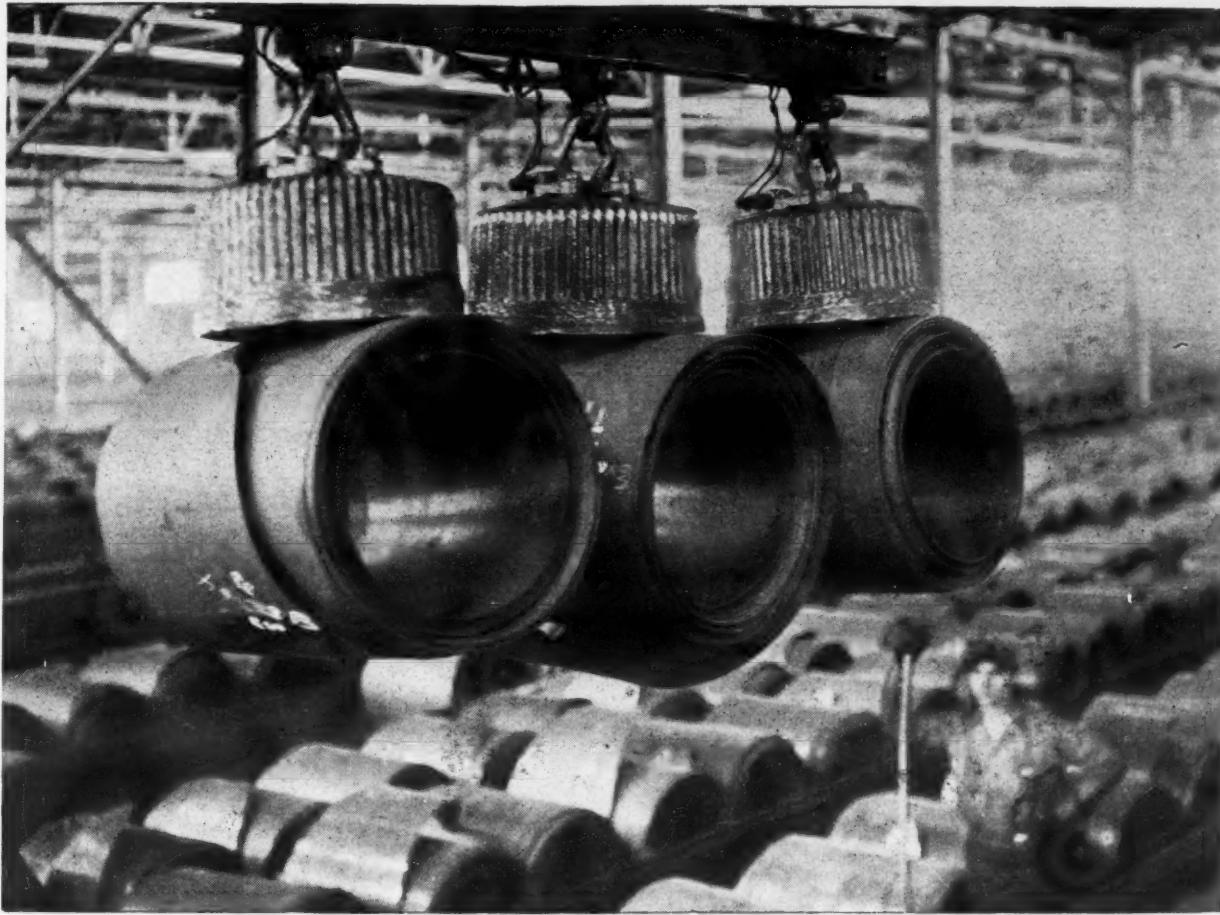
The blooming mill releases its victim. Down the long roll train it scurries, a rabbit escaping from the hounds. But more hazards—Armco's continuous rolling mill is ahead.

It pauses for a few moments in another seething inferno to soak up more of that soothing heat, while its battered molecules readjust and align themselves so the next set of rolls can properly perform their function.

At the other end of the continuous mill, a hand waves, a whistle shrieks. "Let 'er come," a hoarse voice mutters. "She" rushes out like an ambulance on an emergency call, but is suddenly halted. A giant shear bites into the slab of iron, and the section in front is beheaded, and discarded.

The shear continues to chop off block after block—each weighing some 2,000 lbs. These proceed on down the spinning roll train—all except the last chunk which, like the first block, is discarded. A steel plant man will tell

Transporting Enameling Iron at Armco



The large coils of enameling iron are carried by huge electric magnets from the warehouse and unwound, in the plant of the American Rolling Mill Co., Middletown, Ohio. The sheets will undergo numerous other processes, such as annealing, cold rolling, roller leveling, stretcher leveling, or combinations which produce the grade of iron desired.

you that these contain impurities which make them unfit for enameling iron.

From here on we must follow a single block of the iron. On it hurries through roll after roll, big rolls, bigger rolls, giant rolls. We must walk fast to keep up with it. Longer, longer, longer, it grows; it doesn't seem possible that this long strip of iron was once a block of metal some two feet square.

As it nears the end of the continuous mill, its speed becomes more rapid, until finally as it leaves the last set of rolls and ripples up the conveyor the 150 foot strip of metal is traveling at the rate of 1,200 ft. per minute.

But we're not nearly through yet! That strip is coiled and stored in the warehouse. An order comes in for enameling iron, and out comes the necessary number of coils to be unwound and cut up into plate. Then more rolling, more elongation, and we have what is known as "the green sheet."

The sheets are now stacked in piles called "lifts." Each lift has its own stock card attached, bearing a record of the open hearth heat number, when each operation was performed, and other vital information. A crane moves a lift to another conveyor. You look ahead and see a miniature swimming pool into which the sheets are diving.

"I didn't know you used water to make sheet iron," you might exclaim. That water is a dilute acid called a "pickling bath," and the numerous picklings which enameling iron receives are very important. The sheets pass through it and every bit of dirt and impurity is pickled from the surface.

From this point the iron will undergo several different processes, or combinations of processes. The refrigerator manufacturer understands what processes are required to make a sheet which will fill the specifications. There are many different grades of the material, each for a different purpose.

After pickling comes annealing, or cold rolling, or roller leveling, or stretcher leveling, or any number of combinations of these processes, depending upon what type of sheet is needed. Annealing consists of exposing the metal to a slow penetrating heat, either by passing it continuously through a furnace, or by covering piles of sheets with huge cast iron covers, called an annealing box. The box with its cargo of iron is moved into a large furnace and permitted to remain there for several hours. This "tempers" the iron so it is ductile and workable in the dies.

Cold rolling consists of passing cold sheets between revolving rolls. This treatment aligns those tiny invisible molecules of metal, and imparts numerous invaluable qualities to the sheet.

Roller leveling is used where sheets must be of ordinary flatness. Stretcher leveling is the treatment given to secure unusual flatness.

But even after all these operations have been completed, the sheet isn't ready to ship. It must be sheared down to the exact size the customer requires, and then inspected. The latter is an operation requiring unusual skill. Under the "artificial daylight" of mercury lights the inspectors scan each piece of metal for surface defects.

Frequent tests showing the strength of the material and its ductility are made in the nearby testing laboratory. Only then is the iron ready to ship on to the refrigerator manufacturer.

PLAN FROSTED GATE FOR 1933 EXPOSITION

Even on the hottest days, a gate of ice in ornamental architectural style may welcome visitors to the refrigeration exhibit of the Chicago Century of Progress to be held in 1933, according to a recommendation of the mechanical engineering division of the National Research Council Science Advisory Committee, which is co-operating with the exposition authorities in the planning of the science exhibits.

This gate would be constructed of piping, with ornamental hollow iron spheres or other shapes connected with piping. Through this entire structure will circulate cold brine so that the whole gateway will be frosted over, and present the appearance of being made of ice. Through the same method, the word "Refrigeration" will be spelled out in letters of ice over the gateway.

Another exhibit proposed will contrast natural and artificial ice. Natural ice will be represented by an ice harvesting scene in miniature.

A small lake of translucent or opaque glass to represent ice will be shown. On this will be small wax figures of the men and implements employed in cutting and hauling the ice into the ice house. There will also be a wooden model of an ice storage house with one side cut away, giving a view of the interior.

Artificial ice will be portrayed through a miniature model of an artificial ice plant, complete with machinery.

Refrigeration of food will be an important part of the exhibit. "The refrigerator car," the report of the refrigeration committee states, "gave us our first escape from the tin can. Necessity of feeding people in cities had great influence on need for preserving food before marketing."

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B. & O. TRAIN TO HAVE AIR CONDITIONERS

Washington, D. C.—The B. & O. crack express train "Columbian," operating between this city and New York, is to be equipped with air conditioning machinery.

The Baltimore & Ohio Railroad Co. has given the contract to cover diners, club, observation and chair cars.

The system will permit ventilation of the coaches without admission of smoke or dust. A complete air conditioning unit, electrically powered, will be installed in each coach, which will provide conditioned air whether the car is in motion or not.

Opening of windows in the summer time is no longer necessary. The equipment will give a complete change of fresh air, in all coaches, at any desired temperature, every two minutes.

L. MUNDET CONSOLIDATES TWO OF ITS BRANCHES

New York City—L. Mundet & Son, Inc., announces the consolidation of the Charlotte, North Carolina, branch with its branch at Atlanta, Ga. The company manufactures Mundet "Jointite" cork products for cold insulation services, flooring, roofing, etc.

Manager Dick of the Charlotte branch is still covering North and South Carolina, but is working out of the Atlanta branch.

No changes will be made regarding service, and shipments will be made direct from Atlanta stock. All Mundet branches carry a complete stock.

Refrigerator-Equipped Submarine



Sir Hubert Wilkins, left, and Charles E. Wilson, vice president of the General Electric Co., examining the refrigerator and sunlamps installed in the submarine "Nautilus" with which Sir Wilkins plans to explore the Arctic Ocean. It is being equipped in Philadelphia.

UNDERSEA CRAFT TO USE REFRIGERATOR IN ARCTIC

THE NAUTILUS, a submarine which is being prepared to travel across the top of the earth and beneath the North Pole, will be elaborately equipped with electric devices, it has been announced by Sir Hubert Wilkins, explorer. Together with other special apparatus of unique design and purpose, these electric appliances will make the submarine a better dwelling place for the crew of 20 than even Jules Verne's famous *Nautilus*, whose name this modern craft will bear in memory of the great scientific fictionist.

Sir Hubert's *Nautilus* will carry a General Electric refrigerator into the Arctic Ocean. The interior of the submarine will be warm enough, even in the Frigid Zone, to cause food to spoil. The electric refrigerator will be used for the preservation of the food rations. The *Nautilus*, now being equipped at Philadelphia, will also have a complement of General Electric sunlamps, since the boat will be under water so much of the time that, even though the sun shines 24 hours a day in the Land of the Midnight Sun, the men will gain very little exposure to natural sunlight. There will be electric fans to stir up the air when the submarine has been submerged for a long time.

A General Electric radio receiver will provide the crew with entertainment from broadcasting stations during off-hours of the expedition.

The matter of cleanliness will be taken into account far more than is usual on one of these expeditions, through the use of an electric washing machine and electric vacuum cleaner.

An electric stove will be used for cooking, and there will possibly be a number of electric radiant heaters.

Electric currents for these various items of equipment will be supplied by a large storage battery, which will also be used for starting the Diesel propulsion engines.

There will be an auxiliary Diesel generator for recharging the storage batteries when necessary.

The *Nautilus* will be able to remain six days under water, if required, without a recharge of the battery or a change of air. It will travel under the ice by the unique method of the "sledding" principle applied upside down.

A sled deck and a guide will slide along in light contact with the under-surface of the ice, so that the vessel will behave like a marine fly crawling swiftly along a ceiling of ice.

By means of an ice-cutting tool atop a special collapsible conning tower, a hole can be bored through several feet of ice, allowing the crew to crawl out through the conning tower to the ice.

SAN FRANCISCO CO. STARTS SERVICING REFRIGERATORS

San Francisco—Refrigeration Maintenance Corp., Ltd., offices and factory located at 104-106 Olive St., here, has started servicing all makes of mechanical refrigerators.

The firm is also manufacturers' agent for Bush Manufacturing Co., of Hartford, Conn. E. D. Flynn is in charge.

Lindsay Explains Surface Resistance Effects in Refrigerator Insulation

(Concluded from Page 3, Column 5)

sure, the transfer of this energy from one particle to another, averaged throughout the total and aided by convection, offers no serious impediment to the conveyance of heat from one side of the cell to the other, as compared to much larger areas. But the transfer of the heat energy from the relatively fixed particles of the solid wall to the flying gaseous particles, and vice versa—seems to meet with a distinct difficulty.

And when one comes to think of it, this seems rather to be expected. This factor of surface resistance has been the subject of most of my practical investigation and study, and the results have been put to practical use and benefit of insulation in commercial fields for several years.

Two Factors Enter In

In the course of my experiments, I have found that the value of this surface resistance is apparently dependent on two principal factors, both having to do with the nature of the solid surface. I call them *Surface Regularity* and *Surface Rigidity*. The former may be expressed in terms of microscopic smoothness and the latter in terms of resilience. To illustrate them:

If in a single impact of a flying gaseous particle on the relatively fixed wall particles the transfer of heat is incomplete, then it would seem that if the wall surface is sufficiently rough with microscopic crevasses, broken structure, etc., to cause the gaseous particle to rebound therein several times before escaping, the transfer will be more complete because of the additional opportunities afforded for residue transfer.

In other words, the smoother (microscopically) the minute walls in an insulant the better its insulating value—other things being the same.

Again, if the nature of the solid surface is such that it is soft enough or elastic enough to permit the flying gaseous particle to partially sink in or imbed itself momentarily among the solid particles, there should be a much more nearly complete transfer of heat than if its nature is such as to cause a relatively instant rebound—as for example a glass marble from a block of stone.

While these two factors seem to be specific characteristics of a solid surface, their effect is obviously modified by the intermural distance—from one surface to the next. For example:

If a given distance of heat flow we double the number of surfaces of a given specific resistance—we do not double the total resistance to transmission even apparently if we could eliminate from our calculations, conduction through solid matter and radiation. This, of course, is a familiar fact in the vastly larger dimensions of ordinary separated surfaces.

Internal Radiation

So far, however, we have not considered one factor involved in the total heat transmission, and that is internal radiation. I must confess a serious doubt as to the justice of regarding this factor as negligible; personally, I cannot think it unimportant. Whatever its importance, however, it is of distinct interest to find that radiated heat, both luminous and "black," responds to the theory of specific surface resistances with even greater readiness than conducted heat.

I have not space here to detail experiments I have made indicating this, though if the reader does not become wearied with too much "technical stuff" I will be glad to do so later. Suffice it to say now that these tests brought out very prettily and clearly the factors of *Surface Regularity* and *Surface Rigidity*, the latter to a degree to surprise me.

All the experiments I have made on insulation—and it is only proper for me to say that my time being principally occupied in practical work, they are far from being as numerous or refined as I hope to have time later to undertake—have thoroughly borne out this theory of heat insulation, as have the commercial tests and uses over the last five or six years.

In fact, I may say that with a microscope and some knowledge of the nature of the solid, the relative insulating value of a material can be determined fairly closely.

NEW FREEZING PROCESS DISCOVERED IN ENGLAND

London, England—Arthur Rayson, inventor of the defreezing process here, has devised a new method of freezing beef and other foodstuffs. The inventor claims reduction of freezing time, reduction in shrinkage, maintenance of bloom after defreezing, and elimination of bone taint. No chemicals are used, he states.

A syndicate has been formed to handle the patent rights, but no decision has been arrived at as to whether the process shall be demonstrated first from Australia, New Zealand or Argentina. It is possible that a trial shipment of beef, frozen under the invention, may be sent from Queensland early next year. If so, the quarters would be defrosted in London.

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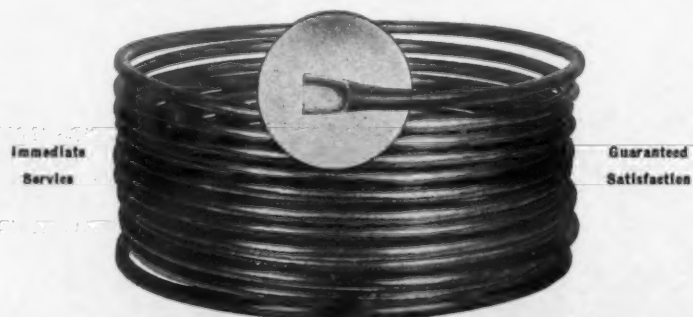
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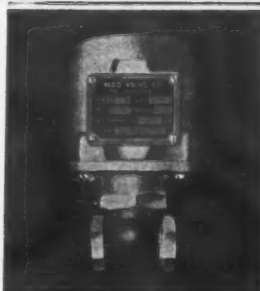
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Judge Brandeis Hands Down Dry-Ice Patent Suit Decision

(Concluded from Page 1, Column 2)

carbon dioxide and sells it to customers of the DryIce Corp. with knowledge that it is to be used in packages covered by DryIce patents, there is no infringement.

The DryIce Corp. is now planning to seek remedies for infringement by suing directly against the user of solid carbon dioxide who makes the patented package without license.

According to officials of the company, the DryIce Corp. had desired not to sue customers, preferring to confine its infringement suits to those who sold solid carbon dioxide for infringing use. The decision of the Supreme Court outlines the procedure for protecting their rights.

The DryIce Corp. operates a chain of 18 plants, and 27 sales outlets distributing its products in this country. Its product, under the trade-mark DryIce, is used in the refrigeration of railroad cars, trucks, ships, and independent packages for mail and express shipment.

Opinion of the Court

Justice Brandeis delivered the opinion of the court:

The American Patents Development Corp., as owner of United States Patent No. 1,595,426, and the DryIce Corp., as exclusive licensee, brought this suit in the Federal Court for Eastern New York to enjoin contributory infringement by the Carbice Company, for an accounting of profits, and for damages. The defendant denied both the validity of the patent and the alleged infringement. The district court, without passing upon validity, dismissed the bill on the ground that infringement had not been shown. 25 F. (2d) 730. The Circuit Court of Appeals held the patent valid and infringed, 38 F. (2d) 62. A writ of certiorari was granted, 281 U. S. 711.

Solid carbon dioxide has a temperature of about 110 degrees below zero. When it "melts," it passes directly into a dry, gaseous state—the gas having a like temperature and being in volume about 500 times that of the solid. These properties make the solid dioxide an excellent dry refrigerant for foodstuffs, particularly for the shipment of ice cream.

Describes Package in Question

The refrigerating transportation package, which is the subject of the patent in suit, is made up in this way: Near the middle of the outer box or carton in which the ice cream or other foodstuff is to be shipped, there is placed, in a small container, a quantity of solid carbon dioxide. So placed, this refrigerant is relatively enduring because it is doubly protected from the exterior heat by the ice cream which surrounds it and by the evaporating gas which excludes air and moisture from the shipping case. The ice cream is kept frozen by both the solid and the gaseous dioxide.

Although the cost of solid dioxide is about 10 times that of water ice, such use is said to have revolutionized the transportation of ice cream, as in this way shipping and handling charges are greatly reduced and the messiness incident to the employment of water ice is eliminated.

The patent in suit is not for solid carbon dioxide. That article and its properties as a refrigerant have been long known to the public. The patent is not for a machine for making solid carbon dioxide. Nor is it for a process for making or using that substance. The Patent Office rejected an application for a process patent. The patent is said to be for a manufacture.

Specifications of the Package

The specifications outline the method of construction and use; and a typical claim (6) is for a "transportation package consisting of a protective casing of insulating material having packed therein a quantity of frozen carbon dioxide in an insulating container and a quantity of freezable product in freezing proximity to said frozen carbon dioxide and the gas evaporated therefrom, arranged so that said frozen carbon dioxide is less accessible for exterior heat than said freezable products."

The sole business of the DryIce Corp. is the manufacture of solid carbon dioxide which it sells under the name of "DryIce." It does not make or sell transportation packages in which solid carbon dioxide is used as a refrigerant. It does not issue to other concerns licenses to make such packages.

ages-upon payment of a stipulated royalty. It does not formally license buyers of its dry ice to use the invention in suit.

Cites Notice on Carton

But each invoice for solid dioxide sold by it bears this notice, "The merchandise herein described is shipped upon the following condition: That DryIce shall not be used except in DryIce Cabinets or other containers or apparatus provided or approved by the DryIce Corp. of America; and that DryIce Cabinets or other containers or apparatus provided or approved by the DryIce Corp. of America shall be refrigerated or used only with DryIce. These uses of DryIce are fully covered by our Basic Method and Apparatus Patent No. 1,511,306. Granted Oct. 14, 1924, and other Patents Pending."

The patent in suit, No. 1,595,426, issued Aug. 10, 1926, is not named in the invoice; but it has been assumed that thereby the DryIce Corp. extends to each of its customers, buyers of solid carbon dioxide, a license to use the invention without the payment of royalty. The restrictions as to the purchase of cartons set forth in the invoices of the corporation appear not to have been insisted upon by it.

Infringement Charged

The Carbice Corp. also manufactures solid carbon dioxide. It is charged with contributory infringement because it sells its product to customers of the DryIce Corp. with knowledge that the dioxide is to be used by the purchaser in transportation packages like those described in the patent. The Carbice Corp. challenges the validity of the patent and denies infringement. Whether the transportation package described is a patentable invention we need not determine. For even if it is, no relief can be granted.

The invention claimed is for a particular kind of package employing solid carbon dioxide in a new combination. If the patent is valid the owner can, of course, prohibit entirely the manufacture, sale, or use of such packages. Continental Paper Bag Co. v. Eastern Paper Bag Co., 210 U. S. 405. Or it can grant licenses upon terms consistent with the limited scope of the patent monopoly. United States v. General Electric Co., 272 U. S. 476, 489. It may charge a royalty or license fee.

But it may not exact as the condition of a license that unpatented materials used in connection with the invention shall be purchased only from the licensor; and if it does so, relief against one who supplies such unpatented materials will be denied. The limited monopoly to make, use, and vend an article may not be "expanded by limitations as to materials and supplies necessary to the operation of it." Motion Picture Patents Co. v. Universal Film Manufacturing Co., 243 U. S. 502, 515. Compare United Shoe Machinery Co. v. United States, 253 U. S. 451, 462; United States v. General Electric Co., 272 U. S. 476, 492.

Compares Relief Sought

The relief here sought is indistinguishable from that denied in the Motion Picture case. There, it was held that to permit the patent-owner "to derive its profit, not from the invention on which the law gives it a monopoly but from the unpatented supplies with which it is used" is "wholly without the scope of the patent monopoly." P. 617. If a monopoly could be so expanded, the owner of a patent for a product might conceivably monopolize the commerce in a large part of unpatented materials used in its manufacture.

The owner of a patent for a process might secure a partial monopoly on the unpatented material employed in it. The owner of the patent in suit might conceivably secure a limited monopoly for the supply not of solid carbon dioxide, but also of the ice cream and other foods, as well as of the cartons in which they are shipped.

The attempt to limit the licensee to the use of unpatented materials purchased from the licensor is comparable to the attempt of a patentee to fix the price at which the patented article may be resold. Bauer & Cie. v. O'Donnell, 229 U. S. 1; Straus v. Victor Talking Machine Co., 243 U. S. 490; Boston Store v. American Graphophone Co., U. S. 8. Compare Bobbs-Merrill Co. v. Straus, 210 U. S. 339. In both classes of cases, courts deny relief against

those who disregard the limitations sought to be imposed by the patentee beyond the legitimate scope of its monopoly.

Plaintiffs seek to distinguish the Motion Picture case from that at bar, by pointing out that there, as in Henry v. A. B. Dick Co., 234 U. S. 1, the unpatented supplies, over which the licensor sought to extend its monopoly, were merely used in the patented machines, whereas here the unpatented refrigerant is one of the necessary elements of the patented product. And to distinguish the case at bar from Morgan Envelope Co. v. Albany Perforated Wrapping Paper Co., 152 U. S. 425, 433, it is pointed out that the Carbice Corporation is furnishing not a passive element in the combination, like the paper in the Morgan Envelope fixture, but the dynamic element which produces refrigeration.

These distinctions are without legal significance. Infringement, whether direct or contributory, is essentially a tort, and implies invasion of some right of the patentee. Compare Moore v. Marsh, 7 Wall. 515, 520; Root v. Railway Co., 105 U. S. 189, 214. The DryIce Corp. has no right to be free from competition in the sale of solid carbon dioxide. Control over the supply of such unpatented material is beyond the scope of the patentee's monopoly; and this limitation, inherent in the patent grant, is not dependent upon the peculiar function or character of the unpatented material or on the way in which it is used. Relief is denied because the DryIce Corp. is attempting, without sanction of law, to employ the patent to secure a limited monopoly of unpatented material used in applying the invention. The present attempt is analogous to the use of a patent as an instrument for restraining commerce which was condemned, under the Sherman antitrust law, in Standard Sanitary Mfg. Co. v. United States, 226 U. S. 20.

Other Cases Cited

The case at bar is wholly unlike Leeds & Catlin v. Victor Talking Machine Co., 213 U. S. 325, 333, on which plaintiffs rely. That was an ordinary case of contributory infringement. The Victor Company sold machines embodying a patent for a combination. Leeds & Catlin were held to be infringers because the intended incorporation in the Victor machines of the article which they sold, did not constitute a repair of the machine and hence was not within the license implied on sale. Heyer v. Duplicator Mfg. Co., 263 U. S. 100. There was no suggestion that the Victor Co., which itself manufactured and sold the patented product, sought "to derive its profits, not from the invention on which the law gives it a monopoly, but from the unpatented supplies with which it is used."

In the case at bar the plaintiffs neither sell nor license others to sell complete transportation packages. They supply merely one of the several materials entering into the combination; and on that commodity they have not been granted a monopoly. Their attempt to secure one cannot be sanctioned.

Reversed.

Present: Presiding Judge William J. Graham, and Associate Judges Oscar E. Bland, Charles S. Hatfield, Finis J. Garrett and Irving L. Lenroot.

ACCURACY STRESSED IN DELCO FACTORY

Dayton—"To err is human, but it is not engineering." This motto, conspicuously displayed in the engineering department of the Delco Products Corp., Dayton, Ohio, is emphasized throughout the entire plant. Tolerances in many cases are held to as low as .0003 in. More than 400,000 Delco motors were produced in this plant last year.

As a single phase A. C. electric refrigeration motor is of the brush-lifting type, this is where noise must be eliminated, according to Delco engineers. These start as repulsion motors, changing to the induction type when the load has been picked up. To accomplish quiet lifting of the brushes, a punched weight governor is used. As the motor gains speed, the weights of the governor spread apart, operating push rods which are connected to the brushes at the opposite end of the armature.

Operation of this governor device is tested on a tachometer so that the spring which keeps the brushes in place for starting is accurately set for tension against the operation of the governor.

A spring washer and a floating collar are used in these motors to avoid end-play and its resultant noise. The spring steel washer and a shoulder on the armature shaft acts as an endwise cushion.

Dynamic balance of the armature is obtained by a specially-designed balancing machine which shows any unbalance in the assembled armature. The operator balances the armature by inserting small lead plugs into holes punched in a rigid-disc of the governor assembly.

Magnetic hum in the motor is held to a minimum by special design of the magnetic circuit.

Since electric refrigeration motors are often the cause of radio interference, by-pass condensers are used in Delco direct current motors so that their operation near a radio set will not disturb reception.

Lubrication of a Delco motor is provided for by using an oil reservoir with a long fibre wool wick feeding system.

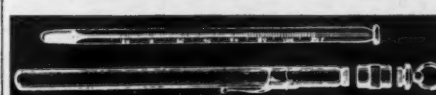
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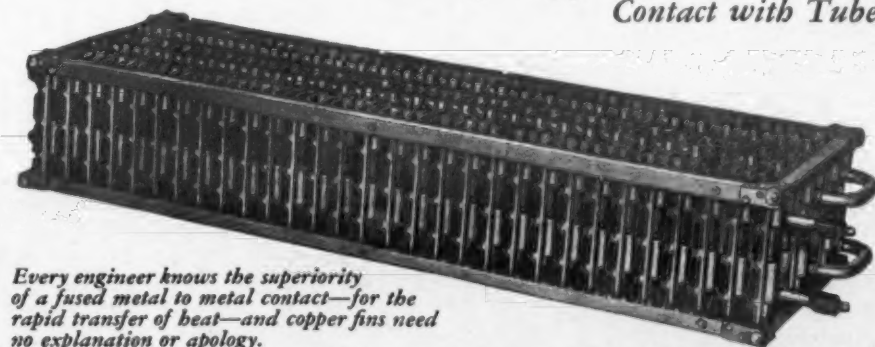
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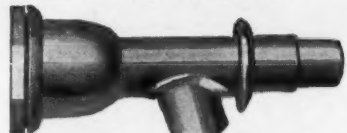
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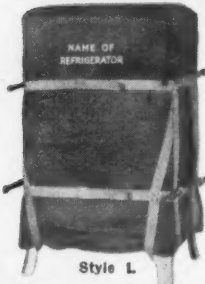
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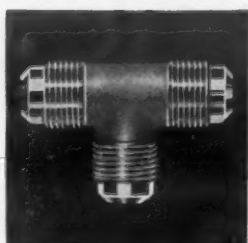
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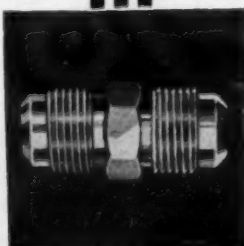
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ISSUED MARCH 10

1,795,310. COMPRESSOR UNLOADER. William E. Mathews, Birmingham, Ala., assignor to Hardie-Tynes Manufacturing Company, a Corporation of Alabama. Filed July 23, 1928. Serial No. 294,907. 9 Claims. (Cl. 137-153.)

1,795,330. FREEZING APPARATUS. Alexander H. Cooke, New York, N. Y., assignor to The Atlantic Coast Fisheries Company, New York, N. Y., a Corporation of Maine. Filed Feb. 10, 1927. Serial No. 167,088. 36 Claims. (Cl. 62-114.)

1. A freezing apparatus comprising a carrier, means on said carrier to support comestibles out of contact with the cooling medium during the freezing operation, depending elements on the carrier to conduct heat away from said comestibles, said elements contracting with said cooling medium whereby the heat is removed from the elements.

1,795,445. RECIPROCATING COMPRESSOR. Walter G. E. Roloff, Kirkwood, Mo. Filed Nov. 21, 1927. Serial No. 234,690. 5 Claims. (Cl. 230-206.)

1. In a reciprocating compressor the combination of a casing affording a pressure chamber having an outlet and adapted to contain a body of lubricant, a cylinder communicating with said pressure chamber and having an inlet opening, a piston working in said cylinder having a valve opening in its head, the valve whereof opens on the outward stroke of the piston, whereby in operation, compressed air will be delivered into said pressure chamber, and an oil line leading from the pressure chamber, below the level of lubricant therein to and communicating with the cylinder at a point thereon adapting it to be alternately opened and closed by the movement of the piston, whereby in each complete cycle of movement of the piston, lubricant will be forced under the pressure in the pressure chamber into the cylinder.

1,795,538. REFRIGERATOR OF THE ABSORPTION TYPE. Georges Beaumont, Marseilles, France. Filed Nov. 22, 1928. Serial No. 321,178, and in France Nov. 9, 1928. 4 Claims. (Cl. 62-120.)

1. A refrigerator of the absorption type comprising in combination: a cyl-

Metal Stampings Unit Bases and Guards

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indrical generator-absorber; a cylindrical evaporator-condenser arranged with its longitudinal axis parallel to that of said generator-absorber; a single S-shaped collecting pipe connecting one end face of said generator-absorber with the opposite end face of said evaporator-condenser; a cone-shaped funnel member located adjacent to the end of said generator-absorber at which said collecting pipe enters and covering the end of said collecting pipe within said generator-absorber; a flat disc of smaller diameter than the internal diameter of said generator-absorber arranged at a short distance from the smaller end of said funnel member; and means for rotating the refrigerator about an axis located approximately at the center of said collecting pipe, substantially as described.

1,795,560. CONTAINER FOR COMPRESSED GASES AND LIQUIDS. Charles Wiswell Johnston, Portsmouth, Va., assignor to Virginia Smelting Company, Portland, Me., a Corporation of Maine. Filed Dec. 7, 1928. Serial No. 324,549. 3 Claims. (Cl. 221-72.5.)

1. In combination, a container for compressed or liquefied gases, having strong retaining walls, and an outlet passageway, a safety device of low melting point hermetically sealing the outlet, a valve housing connected to the outer end of said outlet, a valve stem in said housing adapted to push the safety device inward of the container, and a valve to control the outflow of the contents of the container.

1,795,772. DUAL-EFFECT COMPRESSION METHOD AND APPARATUS FOR PRODUCING CARBON-DIOXIDE SNOW. Justus C. Goosmann, Chicago, Ill. (Cl. 62-121.)

1. In an apparatus of the type described, the combination comprising a source of liquid carbon dioxide, an intermediate receiver connected to said source, an expansive valve in the connection, a snow forming machine connected to said intermediate receiver, a compressor connected to said snow forming machine so that the gas formed in said machine is delivered to said compressor, a connection between the intermediate receiver and the compressor so that the gas in the intermediate receiver is delivered to said compressor, the gases from the snow machine and the intermediate receiver being mixed in said compressor and compressed thereby, a condenser and a connection for delivering the compressed gases to the condenser, a main receiver connected to the condenser for holding the liquid formed in the condenser, and a connection between the main receiver and the intermediate receiver including an expansion valve whereby the liquid is delivered from the main receiver to the intermediate receiver at the pressure of the gas and liquid in the intermediate receiver.

1,795,815. VALVE. Joseph William Winter, Penfield, Pa., assignor to Master Domestic Refrigerating Company, Inc., Conshohocken, Pa., a Corporation of New York. Filed Jan. 18, 1929. Serial No. 333,333. 4 Claims. (Cl. 251-76.)

1. In a valve, the combination with a casing having a cylindrical passage extending longitudinally therein from one end thereof, and ports extending transversely in said casing from the exterior thereof into communication with said passage; said ports having screw threads at their outer ends for connection with pipes; of a valve, comprising a cylindrical plunger fitted to slide in said passage with portions of said valve fitted in substantially fluid tight relation with the wall of said passage; said valve having a reduced portion adapted to be positioned between adjoining ports to establish communication between such ports; a screw threaded cap detachably fitted upon one end of said casing, surrounding the end of said passage, and having a bearing for said valve extending through said cap, in coaxial relation with said passage; annular valve seats surrounding said passage and said bearing, respectively, on the end of said casing and on the inner face of said cap; a stop collar detachably rigidly connected with said valve between said

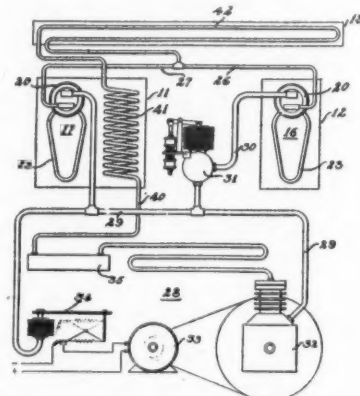
seats, and having recesses in the axially opposite faces thereof; and washers of compressible resilient packing material in said recesses; whereby said valve is freely movable from one extreme of its movement to the other, but the joint surrounding the portion of said valve extending to the outer atmosphere is hermetically sealed at each extreme of its movement by slight compression of said stop collar toward the adjacent seat.

1,795,837. HEAT-EXCHANGE DEVICE. Fritz G. Cornell, Jr., Mountain Lakes, N. J., assignor to Jensen Creamery Machinery Co., Bloomfield, N. J., a Corporation of New York. Original application filed April 9, 1929. Serial No. 353,838. Divided and this application filed Feb. 20, 1930. Serial No. 429,872. 6 Claims. (Cl. 257-247.)

1,795,860. TEMPERATURE-CONTROL VALVE MECHANISM. Frederick W. Jaeger, Milwaukee, Wis. Filed May 1, 1929. Serial No. 359,596. 3 Claims. (Cl. 236-42.)

1. In a device of the character described, the combination of a valve casing, a valve controlling the passage of heating fluid through said casing and having a stem, a flexible walled diaphragm connecting said valve with a portion of the casing, an expansion chamber operatively connected with the stem of said valve to close the valve, spring means operatively connected with said stem to open the valve, and means for balancing the pressure on the inlet side of the valve comprising a member operatively connected with said stem and having a flexible walled joint connected with the casing, and a chamber surrounding said member and in communication with the inlet side of the casing.

1,795,872. REFRIGERATING APPARATUS. David E. Maccabee, Dayton, Ohio, assignor to Frigidaire Corporation, Dayton, Ohio, a Corporation of Delaware. Filed Sept. 29, 1928. Serial No. 309,252. 5 Claims. (Cl. 62-115.)



Patent No. 1,795,872

1. Refrigerating apparatus comprising in combination a pair of means to be cooled, an evaporator for cooling one of said means, and a conduit for supplying liquid refrigerant to the evaporator, said conduit having a portion thermally associated with the evaporator for cooling the liquid refrigerant supply and a portion between said first mentioned portion and the evaporator for conducting the cooled refrigerant in thermal relation with the other of said means to be cooled.

1,795,886. REFRIGERATING APPARATUS. Samuel R. Prugh, Dayton, Ohio, assignor, by mesne assignments, to Frigidaire Corporation, a Corporation of Delaware. Filed June 30, 1927. Serial No. 202,619. 3 Claims. (Cl. 62-116.)

1. A refrigerator comprising a cabinet rectangular in cross section having a storage compartment, a machine compartment and four vertical outer walls, one of said walls of said cabinet having a door opening for the storage compartment and an opening in the machine compartment, an air cooled condenser within the machine compartment, means for circulating air outwardly from the machine compartment through said latter opening, and means for directing said air sideways away from the door opening.

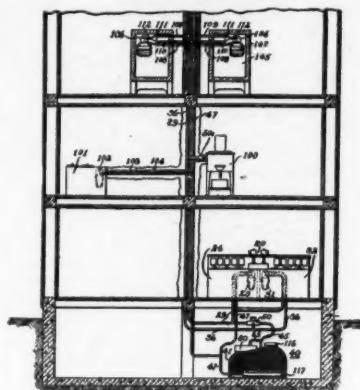
1,795,907. THERMOSTAT. Adolph A. Thomas, New York, N. Y. Filed April 16, 1927. Serial No. 184,191. 9 Claims. (Cl. 297-15.)

1. A thermostat comprising a bowed spring member adapted to change its shape abruptly by external force, a thermostat bar supported at its ends and midway thereof normally engaging the central portion of said spring member, said thermostat bar being movable at its central portion under the action of heat to exert pressure against said bowed spring member until the latter snaps into a position of reverse curvature out of contact with said bar, and a connection between said spring member and said bar whereby the latter on cooling exerts pressure against said member until it snaps back to initial position.

1,796,007. REFRIGERATING APPARATUS. Ernest Dickey, Dayton, Ohio, assignor to Frigidaire Corporation, Dayton, Ohio, a Corporation of Delaware. Filed March 25, 1929. Serial No. 349,798. 10 Claims. (Cl. 62-115.)

1. A refrigerating system comprising means for circulating a cooling medium, a plurality of cabinets, a plurality of cooling units in said cabinets, a cooling medium distributing line connected to said means and units, a cooling medium collecting line connected to said means and units, one of said lines comprising

two branches wherein the cooling medium is maintained in a condition to import different temperatures from said



Patent No. 1,796,007

branches respectively to said cooling units, and means to connect selectively either branch to any of said units and to disconnect the other branch.

1,796,101. SWITCH STRUCTURE WITH UNIT CONTROL. Malcolm E. Henning, Des Moines, Iowa, assignor to Penn Electric Switch Co., Des Moines, Iowa, a Corporation of Iowa. Filed June 16, 1930. Serial No. 461,545. 16 Claims. (Cl. 200-83.)

1. In a switch structure, a switch mechanism, a thermal cutout mechanism and an adjustment control mechanism for the switch mechanism, a unit control comprising a handle for operating the adjustment control mechanism and means, actuated by the handle at different positions of its movement, to render the thermal cutout mechanism effective and ineffective.

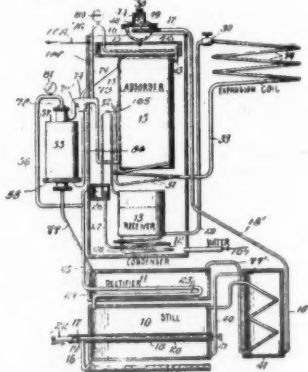
1,796,151. ICE-CUBING MACHINE. Albert Hoppel, Toledo, Ohio, assignor to Uline Ice Scoring Machine Company, Toledo, Ohio, a Corporation of Ohio. Filed Nov. 7, 1927. Serial No. 231,734. 33 Claims. (Cl. 143-38.)

ISSUED MARCH 17

1,796,276. REFRIGERATING APPARATUS. Frank W. Andrews, Dayton, Ohio, assignor, by mesne assignments, to Frigidaire Corporation, a Corporation of Delaware. Filed March 31, 1927. Serial No. 179,984. 3 Claims. (Cl. 62-116.)

1. Refrigerating apparatus comprising in combination, a container for liquid, a refrigerant evaporator in the container including a plurality of conduits for refrigerant, and a high-pressure tank substantially enclosed by the evaporator and provided with an inlet and an outlet for circulating liquid to be cooled.

1,796,410. REFRIGERATING SYSTEM. Ralph Edward Schurtz, Kansas City, Mo. Filed Dec. 20, 1918. Serial No. 267,614. 3 Claims. (Cl. 62-5.)

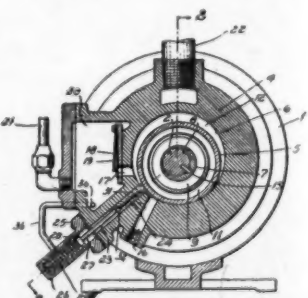


Patent No. 1,796,410

1. In a refrigeration system of the character described, a still, a condenser, an absorber, a liquefied gas collector, an evaporator and conduits connecting the above mentioned elements, in combination with means responsive to pressure in the absorber together with thermodynamic means associated with the still, both constructed to govern the strength of the liquid in the absorber and the still so as to maintain with close approximation a uniform quantity of liquefied gas in the liquefied gas collector.

1,796,440. COMPRESSOR-VALVE MECHANISM. Niels A. Christensen, Cleveland, Ohio. Filed Jan. 20, 1928. Serial No. 248,140. 9 Claims. (Cl. 230-228.)

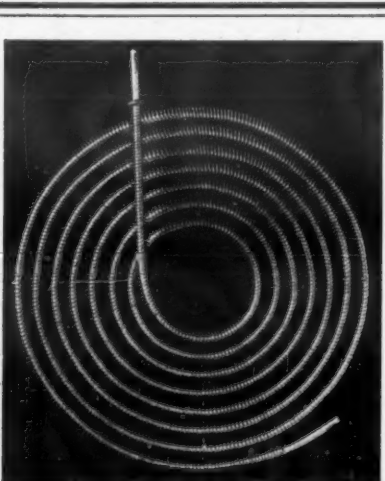
1,796,535. BLADE CONSTRUCTION FOR COMPRESSORS OF THE ROTARY TYPE. Walter G. E. Roloff, Kirkwood, Mo. Filed Sept. 26, 1927. Serial No. 221,977. 6 Claims. (Cl. 230-149.)



Patent No. 1,796,535

1. In a compressor, having a rotor and a cylinder affording a blade slot, a

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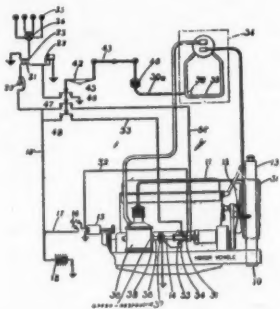
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blade slidably mounted in said slot and bearing at one end on the periphery of said rotor to separate the inlet from the discharge of said cylinder, said blade comprising two members placed side by side and having a point of contact providing corresponding inclined surfaces, one of said members projecting beyond the other at its inner end and providing the contact surface for the rotor and the other member being longitudinally movable with respect to the first member, and means for continuously exerting yielding pressure on the outer end of said other member to cause its inclined surface to ride over the inclined surface of the first named member, whereby to cause said blade to expand and maintain sealing contact with the walls of its slot.

1,796,568. ICE-MAKING SYSTEM. Aubrey M. Lee, University Place, Texas. Filed Sept. 4, 1928. Serial No. 303,799. 3 Claims. (Cl. 62-159.)

1. In an ice producing apparatus, a container for holding a refrigerant, a water can in said container, a removable bottom for the can, whereby the block of ice may be harvested from the bottom of said can, and a removable cover for the upper end of the can sealed thereto to form a vacuum as the ice is withdrawn from the can.

1,796,627. REFRIGERATING APPARATUS. Warren H. F. Schmieding and Theodore L. Chisholm, Dayton, Ohio, assignors to Frigidaire Corporation, Dayton, Ohio, a Corporation of Delaware. Filed March 31, 1928. Serial No. 266,399. 17 Claims. (Cl. 62-117.)



Patent No. 1,796,627

1. Refrigerating apparatus comprising in combination, a motor vehicle, a motor for driving the vehicle, a refrigerating system including a compressor, and means for mechanically connecting the compressor to the vehicle motor in response to refrigerating demand.

1,796,644. METHOD OF AND APPARATUS FOR REGULATING COOLING OF TROUGHS. Frank G. Carrington, Anniston, Ala., assignor to Ferric Engineering Company, Anniston, Ala., a Corporation of Delaware. Filed April 13, 1927. Serial No. 183,465. 16 Claims. (Cl. 22-65.)

1,796,658. COOLING AND VENTILATING APPARATUS. Andre M. Mertzianoff, New York, N. Y., assignor to American Radiator Company, New York, N. Y., a Corporation of New Jersey. Filed Jan. 27, 1928. Serial No. 250,017. 3 Claims. (Cl. 62-134.)

1. An apparatus of the character described comprising a closed casing having an air inlet therein, a tubular member disposed centrally within said casing with its wall portions in spaced relation to said casing and having an air inlet at its top, and an air outlet disposed in a horizontal plane below the air inlet in said casing, a refrigerating coil disposed within said member, means for circulating a refrigerating medium through said coil and means communicating with the interior of said refrigerating coil for conducting air to said tubular member independently of that received by said member from said casing.

1,796,726. THERMOSTATICALLY-CONTROLLED SWITCH. Edmund Scherer, Pittsburgh, Pa. Filed Feb. 25, 1928. Serial No. 256,910. 4 Claims. (Cl. 200-139.)

1. A thermostatic device comprising a thermostatic element, a pivoted hanger, a member associated with said hanger for engagement by said element, a cam member associated with said hanger for adjusting the projection of said member with respect to said hanger, and a mercury tube switch carried by said hanger.

1,796,759. RAW-WATER ICE SYSTEM. Joseph A. Martocello, Philadelphia, Pa. Filed Jan. 1, 1928. Serial No. 610,081. 8 Claims. (Cl. 62-159.)

1,796,772. DISTILLATE - CHILLING APPARATUS. Henry Torrance, New York, N. Y., assignor to The Carbondale Machine Co., Carbondale, Pa., a Corporation of Pennsylvania. Filed June 16, 1927. Serial No. 199,287. 3 Claims. (Cl. 257-86.)

1. An apparatus for chilling liquids to separate solids therefrom, including a zigzag conduit having straight pipe sections and connecting headers in series for the liquid to be chilled, the cross-sectional area of said headers and the inlet and outlet of said conduit being of approximately the effective cross-sectional area of the straight sections to permit large volume flow of liquid through said conduit, a zigzag conduit

having pipe sections encircling the first mentioned pipe sections, and headers connecting the second mentioned pipe sections in series for conveying the cooling medium in counter-current flow to that of the liquid to be chilled, and a conveyor in each of said inner pipe sections, said conveyor including a central shaft and a helical ribbon blade secured to but spaced from the shaft and serving to scrape solid matter from the wall of the pipe section and advance it along the latter, the spacing of the blade from the shaft permitting a rapid flow of liquid along the shaft, and the blade causing eddy currents of said liquid between successive turns of the blade.

1,796,828. ELECTRIC REFRIGERATOR. Mabel M. Chingman, Chicago, Ill. Filed Dec. 15, 1927. Serial No. 240,115. 4 Claims. (Cl. 62-4.)

1. In an artificially cooled refrigerator operated by electric power, an electric circuit for supplying said power, a switch included in said circuit and having a pair of electrical contacts and a switch arm for closing said contacts, an operating arm forming a part of the switch, a spring for urging said operating arm in a direction away from the contacts, and means carried by the refrigerator door for holding the operating arm in a position to actuate the switch arm to close the two electrical contacts when the door is closed.

1,796,829. AUTOMATIC REFRIGERATOR. Mabel M. Chingman, Chicago, Ill. Filed March 12, 1928. Serial No. 260,936. Renewed Aug. 12, 1930. 8 Claims. (Cl. 62-116.)

8. In an automatic refrigerating system comprising a refrigerating plant for circulating a refrigerant for individual refrigerators, each of said individual refrigerators being equipped with a door affording access to the interior thereof, means effective upon opening said door to interrupt circulation of the refrigerant through said individual refrigerator.

1,796,859. REFRIGERATING MEANS AND METHOD. Samuel C. Bloom, Chicago, Ill. Filed April 13, 1925. Serial No. 22,688. 2 Claims. (Cl. 62-104.)

1. The combination with a cooling chamber, of a deck in the upper part of said chamber, said deck comprising means for retaining a pool of cooled secondary refrigerant, pipe coils above said deck for a primary refrigerant, and means for withdrawing said secondary refrigerant from said pool and spraying it into contact with the air in said chamber to cool and circulate the air and then into contact with said coils to recirculate the secondary refrigerant.

1,796,907. REFRIGERATING APPARATUS AND METHOD. Walter S. Josephson, Brooklyn, N. Y., and Thomas B. Slate, Glendale, Calif.; said Josephson, assignor, by mesne assignments, of his right to DryIce Equipment Corporation, a Corporation of Delaware; said Slate assignor of his right to American Patents Development Corporation, New York, N. Y., a Corporation of Delaware. Filed Sept. 10, 1924. Serial No. 736,954. Renewed Jan. 27, 1931. 29 Claims. (Cl. 62-91.5.)

1. Means enclosing space to be refrigerated and means for refrigerating it, including a heat insulated container, said container enclosing a supply of solidified carbon dioxide adapted to sublimate upon absorption of heat, thereby yielding a low temperature refrigerant gas, said container embodying also a heat conducting element upon which said solidified carbon dioxide normally rests, and means whereby a downwardly exposed portion of the under surface of said conducting element is accessible only by upflow of the air or gas within the refrigerated space.

1,796,908. REFRIGERATING APPARATUS AND METHOD. Thomas B. Slate, New York, N. Y., assignor, by mesne assignments, to American Patents Development Corporation, New York, N. Y., a Corporation of Delaware. Filed Sept. 27, 1924. Serial No. 740,162. Renewed Feb. 17, 1930. 13 Claims. (Cl. 62-91.5.)

1. A refrigerator and a permanently insulated container therein for refrigerating perishable products, said container enclosing solid cakes of frozen carbon dioxide sufficient for a long period deriving heat from and discharging the resultant cold gas into the atmosphere containing said products, the surface area of the insulated container being great as compared with its capacity, the thickness of the insulation of the container being such that the contained refrigerant tends to maintain the outer surface of the insulation near the freezing point of water, so that such surface will collect frost from the refrigerator atmosphere at or below the freezing point of water, and will permit evaporation or melting of such frost to decrease its insulating effect when said atmosphere is at a temperature above the range for which refrigeration is desired.

1,796,909. REFRIGERATING APPARATUS AND METHOD. Thomas B. Slate, Glendale, Calif., assignor, by mesne assignments, to American Patents Development Corporation, New York, N. Y., a Corporation of Delaware. Original application filed Sept. 27, 1924. Serial No. 740,162. Divided and this application filed Feb. 10, 1931. Serial No. 514,853. 33 Claims. (Cl. 62-91.5.)

1. A refrigerator and a plurality of similar suitably insulated metal lined

containers therein for refrigerating perishable products without freezing them, each said container being of suitable capacity for enclosing cakes of frozen carbon dioxide, of relatively great surface area as compared with its capacity and heavily insulated to preserve the same for a long period and each deriving heat from and discharging the resultant cold gas into the upper part of the atmosphere containing said products, the insulation of each container being predetermined with reference to the freezing point of water so as to insure relatively small temperature drop between said atmosphere and the heat absorbing surfaces of the container when said atmosphere is near said freezing point.

1,796,910. REFRIGERATING APPARATUS AND METHOD. Thomas B. Slate, Glendale, Calif., assignor, by mesne assignments, to American Patents Development Corporation, New York, N. Y., a Corporation of Delaware. Original application filed Sept. 27, 1924. Serial No. 740,162. Divided and this application filed Feb. 10, 1931. Serial No. 514,854. 20 Claims. (Cl. 62-91.5.)

1. The method of refrigeration which consists in enclosing within a chamber with the material to be refrigerated, a quantity of suitably insulated solid carbon dioxide which on absorption of heat from the atmosphere within the chamber, passes directly from the solid to the gaseous state, and permitting gas thus formed to escape into the atmosphere of said chamber rendering the rates of said heat absorption practically independent of decrease in the amount of said solid by supporting the solid upon good conducting material, within and suitably protected by the insulation of the heat absorbing surfaces.

1,796,916. REFRIGERATING APPARATUS. Arthur B. Bonheim, Chicago, Ill. Filed April 18, 1927. Serial No. 184,539. 11 Claims. (Cl. 62-101.)

5. In a drink dispensing apparatus, the combination, in a unitary structure, of a container for liquids on draft, a base for said container, a cooling coil in heat exchanging relation with but separate from said container, and a motor driven pumping unit in said base for circulating a refrigerant through said coil.

1,796,920. METHOD OF TREATING BRINE. William R. Collings, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich., a Corporation of Michigan. Filed Sept. 12, 1928. Serial No. 305,493. 13 Claims. (Cl. 23-91.)

12. In a method of separating calcium and magnesium chlorides from solutions containing the same which includes separating tachydrite crystals from a mother liquor having a higher proportion of calcium chloride to magnesium chloride than the original solution, the step which consists in dissolving such crystals in a limited amount of water with heating such that a solution is produced from which upon cooling to approximately 30° C. crystals of magnesium chloride hexahydrate will be precipitated and the filtrate remaining from the crystals will have a gravity of between 42.5° and 43° B.

1,797,029. CONDENSER FOR REFRIGERATING SYSTEMS. Christian Steenstrup, Schenectady, N. Y., assignor to General Electric Company, a Corporation of New York. Filed Oct. 4, 1928. Serial No. 310,371. 12 Claims. (Cl. 257-261.)

1. An air-cooled condenser for refrigerating systems comprising a supporting member, an annulus of fins of zigzag form surrounding said supporting member and a condenser chamber secured to the outwardly projecting por-

tions of said fins in heat exchange relation therewith.

1,797,030. MAKING HEAT EXCHANGERS. Christian Steenstrup, Schenectady, N. Y., assignor to General Electric Company, a Corporation of New York. Original application filed Oct. 4, 1928. Serial No. 310,371. Divided and this application filed Nov. 15, 1929. Serial No. 407,541. 7 Claims. (Cl. 29-157.3.)

1. The method of making a heat exchanger having a supporting member, cooling fins and a chamber, which comprises arranging the chamber about the fins so as to constitute an annulus, and pressing the fins on the supporting member so as to secure the fins and the chamber thereto.

1,797,128. LIQUID COOLER. Harry E. Cann, West Chester, Pa. Filed Jan. 18, 1930. Serial No. 421,849. 3 Claims. (Cl. 62-101.)

1. The combination with a receptacle containing a cooling agent, and a cooler associated therewith, of means for circulating the cooling agent between the receptacle and the cooler, and means within the receptacle for maintaining the cooling agent which passes through the cooler at a temperature above that of the cooling agent within the receptacle.

1,797,133. AUTOMATIC WATER-COOLED REFRIGERATOR. William Doherty, West Philadelphia, Pa. Filed Nov. 19, 1927. Serial No. 234,476. 1 Claim. (Cl. 137-65.)

In a refrigerator, a casing, a water inlet pipe extending through the bottom of said casing, a valve controlling the inlet pipe, a support secured to and rising from the bottom, a weighted lever pivoted adjacent one end to the support and carrying the valve, a float actuated lever linked at one end to the adjacent end of the valve carrying lever and having pivotal connection in said casing, an outlet pipe extending through the bottom of the casing, a manually operated valve for controlling the outlet pipe, a drain pipe in communication with the outlet pipe and rising therefrom to a plane above the top thereof, and means of communication between the inlet pipe and the outlet pipe and through the instrumentality of the drain pipe.

Designs

83,687. DRINKING-WATER COOLER FOUNTAIN. John A. Macready, Dayton, Ohio, assignor to Frigidaire Corporation, Dayton, Ohio, a Corporation of Delaware. Filed Nov. 30, 1928. Serial No. 29,074. Term of patent 14 years.

The ornamental design for a drinking water cooler fountain.

83,694. REFRIGERATOR HINGE. William M. Myers, Dayton, Ohio. Filed Dec. 15, 1930. Serial No. 37,997. Term of patent 7 years.

The ornamental design for a refrigerator hinge.

83,695. REFRIGERATOR LATCH. William M. Myers, Dayton, Ohio. Filed Dec. 15, 1930. Serial No. 37,998. Term of patent 7 years.

The ornamental design for a refrigerator latch.

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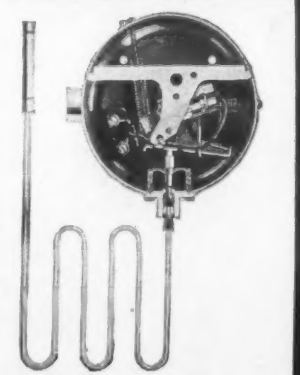
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No. 858 MODEL LL-1
MERCROID CONTROL

Supplied with adjustable ranges—minus 10° to plus 25° and plus 10° to plus 50°. Differential as close as 2 1/2° or as wide as 12°. Standard bulb 3" long, 1/2" dia. The "Milk Cooler" Type has a bulb 21" long, 1 1/2" dia.

A special MERCROID CONTROL for Milk Coolers

Accurate control of milk coolers has always been a difficult problem because of the unusual conditions under which they are operated. Now a specially designed Mercoid has solved the difficulty and maintains a constant temperature at just the right degree in cold or warm weather.

Since most milk cooler installations are located at a distance from dealers' stores, service calls are costly. That is why Mercoid, with its freedom from service, its positive accurate performance and its absolute dependability is the ideal control for this purpose.

The No. 858 Model LL-1 Mercroid Control for Milk Coolers meets every requirement of this special field. It operates by the well-known Mercoid Switch which carries 110 or 220 volt current without corrosion of contacts or an exposed arc. It is accurate, durable and easily adjusted for cut-in or cut-out points.

Write for description of this "Milk Cooler" Mercroid Control and other controls for all refrigeration needs—including the No. 682 Arco Solenoid Valve for water cooled units or for refrigerant lines.

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